

JULY 1956

AMERICAN ARTISAN

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RESIDENTIAL AIR CONDITIONING
WARM AIR HEATING
SHEET METAL CONTRACTING

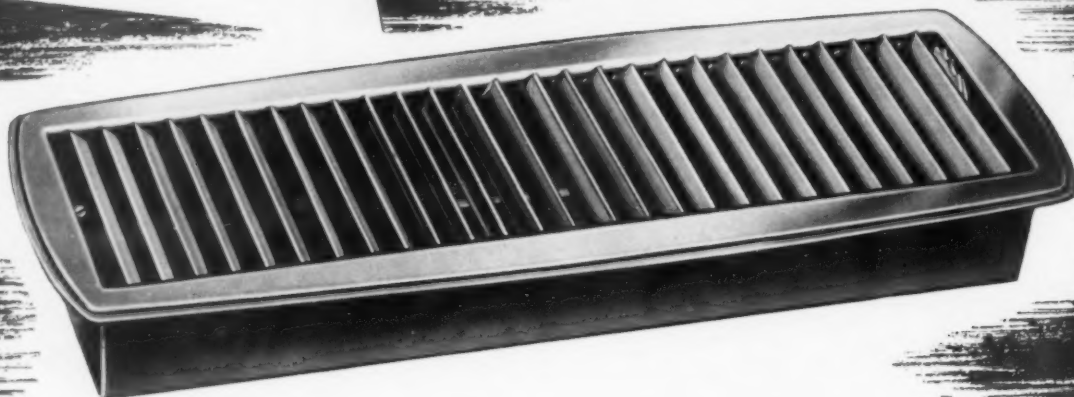
COST CONTROL system boosts profits
from sales promotion 71



THIS DIFFUSER MAKES THE DIFFERENCE

Air Control

No. 42 SERIES FLOOR PERIMETER DIFFUSER



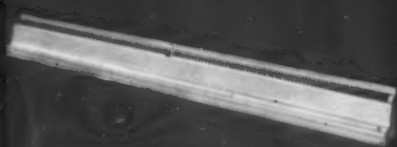
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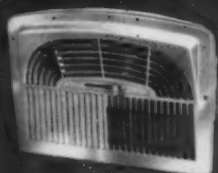
WIDE RANGE OF POPULAR SIZES — SEE YOUR JOBBER



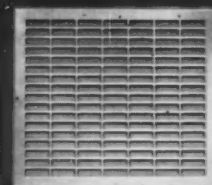
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AMERICAN ARTISAN

JULY 1956

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RESIDENTIAL AIR CONDITIONING WARM AIR HEATING SHEET METAL CONTRACTING

Merged with American Artisan are "Warm Air Heating" and "Furnaces and Sheet Metals"

Editorial Director—C. M. BURNAM JR.

EDITOR

CLYDE M. BARNES

ASSOCIATE EDITOR

PHILIP D. WARD

ASSISTANT EDITORS

H. C. LENNARTSON

F. HAROLD ALBERT

ADVERTISING STAFF

WALLACE J. OSBORN

ROBERT J. OSBORN

New York City

MURRAY HILL 9-8293

ROBERT A. JACK

DAVID V. MAHAN

Cleveland

SUPERIOR 1-1291

GEORGE C. CUTLER

THOMAS V. JOHNSON

JAMES E. SACRA

Chicago

STATE 2-6916

JAMES D. THOMAS

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6-3698

R. PAYNE WETTSTEIN

Los Angeles—DUNKIRK 8-2286

San Francisco—YUKON 6-2522

Portland—CAPITOL 8-4107

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Production Manager—L. A. DOYLE
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It Makes Sense!

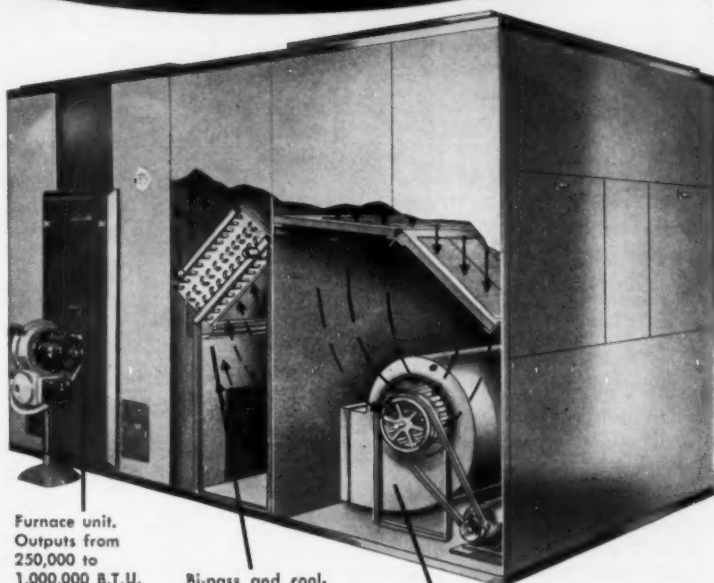
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SUSPENDED**



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Oil or gas fired.

the editor's notebook

Thumbing Through This Month's Artisan

... we visit a pioneer in perimeter heating whose success formula, *Appealing Sign + Engineering Skill = Growing Business, Customer Confidence*, has stood the test of 20 years' time and pays off in profitable jobs such as installing perimeter heating systems in a 40-house project. We see how the dealer follows through in his formula, using association membership, newspaper and phone book advertising and effective displays to pull new leads in addition to those brought in by satisfied customers.

Split-Level

... and we follow the NWAHACA Mobile Laboratory through a second five day project where *Split-Level Heating Test Pinpoints Some Air Distribution Problems* in a tri-level, frame dwelling with a 79,005 Btuh total heat loss, served by a 136,000 Btuh oil-fired low-boy furnace and a 3 ton cooling unit. We inspect the unusual supply and return duct systems, characterized by long runs and devious paths which require excessive blower speeds and consequent noise. Finally, we note the testing crew's suggestion for improving distribution and temperature balance — suggestions which will eliminate some of the complaints toward split-level heating.

Cycling

... we find out *What to Do About Short Cycling of Compressor Motor* in cooling systems from S. W. Reid, who advises prompt investigation of the short cycling danger signal before serious breakdown occurs. The author describes

INCREASE EQUIPMENT SALES ... cut down delivery costs

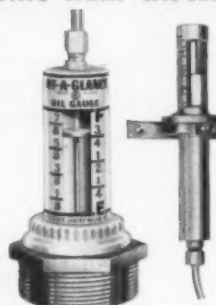
Sentry ODF® Tank Gauge tells drivers what they want to know
at point of delivery!



ONLY *Sentry* OFFERS SUCH A COMPLETE LINE
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Combination At-A-Glance tank and remote reading gauges



KRUEGER *Sentry* GAUGES
GREEN BAY • WISCONSIN

the editor's notebook

(continued)

the job a compressor motor must do under varying conditions and points to the thermostat, high and low pressure cutouts and electrical overload switch as the devices to check when short cycling occurs. We are shown how each device fits into the total cooling picture, how it can cause short cycling, and what to do when it does.

Plastics

... and we see that *New Strides in Sheet Plastics Open Ripe Market for Contractors* when we visit Alfred Goethel Sheet Metal Works, a shop which is keeping up with the increasing demand for plastic ventilation and exhaust systems as well as other applications requiring corrosion-resistant components. We see how ducts, fittings, etc. are handled and fabricated with standard sheet metal shop equipment. We follow the techniques used in welding plastic sheets, and we see how a good selling job plus a high regard for customers' needs is opening the door to a profitable activity for this enterprising dealer.

Only Minutes a Day For Earning a Profit

IN DISCUSSING business problems with dealers and contractors around the country, I've heard them describe in many ways the small amount left over after paying all the expenses involved in operating a business. But the National Association of Manufacturers presents the picture in still another manner. According to NAM, out of the eight hour working day, the average company spends all but 19 minutes in paying off the cost of doing business. These 19 minutes (at the end

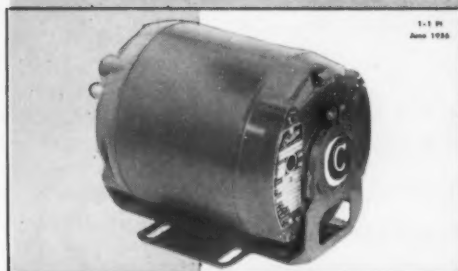
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on



INDUSTRIAL QUALITY... FRACTIONAL H.P. ELECTRIC MOTORS



1-1 PI
June 1956

INDUSTRIAL QUALITY
FRACTIONAL
HORSEPOWER
48 FRAME AND
56 FRAME
1/20 to 1 HORSEPOWER

OPEN AND ENCLOSED TYPES
PAGES 3 TO 6
MECHANICAL VARIATIONS
PAGE 7
ELECTRICAL TYPES
PAGE 8
RATINGS AND DIMENSIONS
PAGE 9



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OF INDUSTRIAL QUALITY ELECTRIC
MOTORS, NEW AND IMPROVED
MATERIALS, DESIGNS AND
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Right at your desk, make a detailed inspection of Century's Fractional H.P. single phase and polyphase line of motors, designed to latest NEMA standards! This fact-filled new book gives you the comprehensive story on Century's new 48-Frame and 56-Frame INDUSTRIAL QUALITY Motors...tells how and why they're *better performers* than the older models, why they weigh less, take less space, are easier to handle.

Motor types and mountings are described, stator and rotor construction, how to select proper torque and speed... and many other facts to help you choose the right motors for *top performance*... all along the line!

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Please send New Bulletin 1-IP1 to:

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Company.....
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City..... Zone..... State.....

Performance-Rated
MOTORS
1/20 to 400 H.P.



CENTURY ELECTRIC COMPANY

1806 Pine Street • St. Louis 3, Missouri • Offices and Stock Points in Principal Cities

the editor's notebook

(continued)

of the day) are left in which to earn a profit. This is a pretty small part of the day and without careful attention even this small portion can be easily lost. If operating costs seem to be on the increase and profits appear to be dropping (other conditions remaining the same) it would be a good idea to look over what's taking place at the end of the day. Are your employees leaving ahead of time, knocking off early in order to be ready for the clock to strike? Or are they just getting fatigued and slowing down? You know the remedies for these situations if you find they exist.

Minnesota Dealer Wins Award

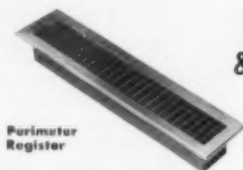
THE HONOR recently bestowed on Walker Jamar of Duluth was well deserved. Mr. Jamar received Duluth's 1955 Hall of Fame Award at a dinner held in honor of the outstanding contributions in the Duluth area. The aggressive business development program began under his guidance during the two years he served as president of the Duluth Chamber of Commerce (1945-46). During the years I've known him, Walker has always given freely of his time and has offered solid advice and guidance to the Minnesota Sheet Metal Contractors' Association as well as to the local sheet metal group. I am pleased to see this recognition accorded him, and to the many messages of congratulation he has received, I feel privileged to add mine.

41% of AGA Dollar For Sales Promotion

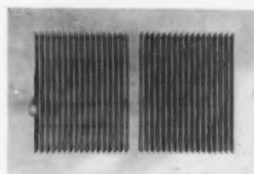
WHILE READING through the recently published annual report of the American Gas



A Complete Line of
Registers, Grilles & Diffusers
for the Residential Field plus
a Complete Line of
Double Deflection Registers
& Diffusers with Opposed Blade



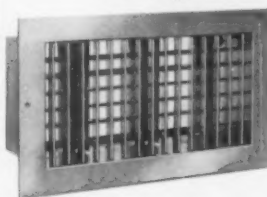
Perimeter Register



Multi-Louver Register

4-Way Deflector with Opp. Blade

Dampers, Extractors
& Volume Control for
the Commercial
& Air Conditioning Field



WRITE OR WIRE FOR PRICE CATALOG
AND NAME OF YOUR NEAREST JOBBER



KRUEGER
AIR CONDITIONING COMPANY

19 E. RILLITO • TUCSON, ARIZONA • PHONE 2-2805

the editor's notebook

(continued)

Association, I became especially interested in the breakdown of the association's expenditures. I believe you will be as surprised as I was to learn that the largest expenditure was for sales promotion. This amounted to 41 percent and was broken into two categories, advertising (23 percent) and promotion (18 percent). Only a single activity had a larger percentage than advertising or promotion. This was research, which accounted for 30 percent of the total. Other expenditures were administration (12 percent), general activities (9 percent), sectional activities (3 percent), publications (3 percent) and gas appliance standards (2 percent).

The value of sales promotion is certainly brought out in this breakdown, and the association is to be congratulated for the fine job it is doing to keep the public informed and interested in the product AGA represents.

High Production Costs Disappoint 'Inventor'

ON SEVERAL occasions last winter and the winter before, I paid particular attention to the growing number of window air conditioners being left in place throughout cold weather. Each time I noticed this trend, I kicked around the thought that here was a market for an insulated metal casing that could be easily installed at the end of the warm weather and removed in the spring. Before I recommended such a thing I decided to follow through each of the steps involved in the fabricating of such a product. I wanted to check time, material, etc. to find out the costs involved and what markup should be applied so that a possible selling price could be suggested.

the

LOCKFORMER

Slitter...

1 As an attachment for your present Lockformer...

2 As a complete bench model slitter mounted on its own power unit...

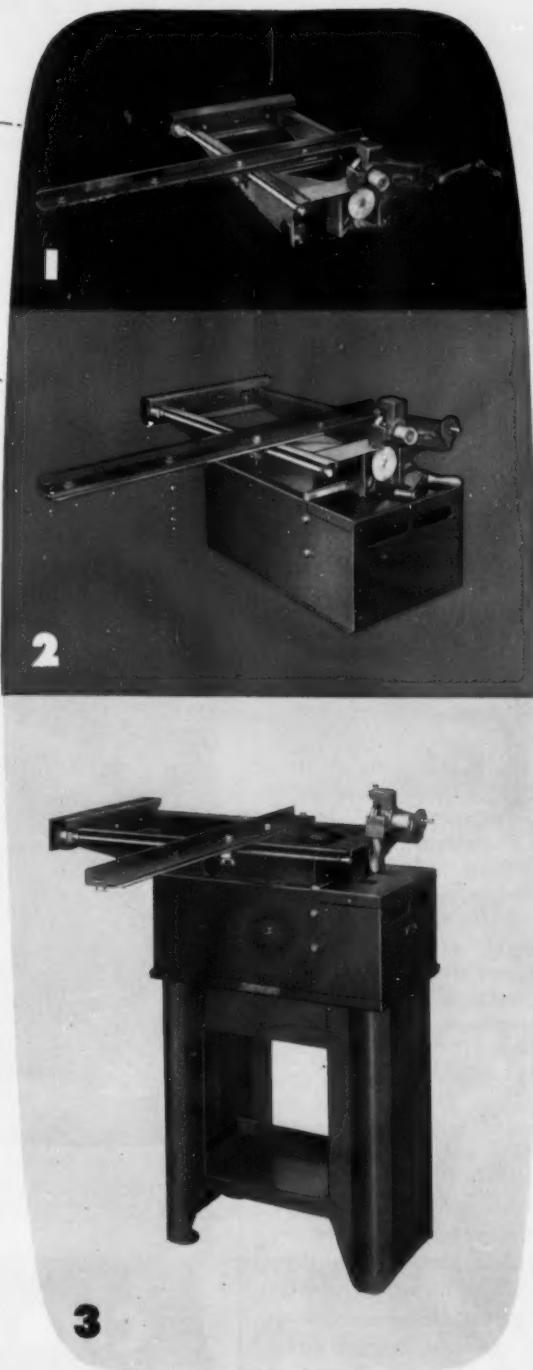
3 As a floor model with power unit on special stand

Regardless of how you use it—as an attachment or a powered bench or floor model—the Lockformer Slitter has *all* the features needed by sheet metal shops. It can be installed on either the “20” or the “22” in ten minutes and doesn’t interfere with either built-in or auxiliary rolls—handles 20 gauge or lighter, shears 30 to 35 feet per minute and does any shearing job on sheets as wide as 48 inches.

It handles any length from less than one inch to infinity, and tolerance is only $\frac{1}{32}$ " on an 8' sheet.

Mechanically operated back gauge is always parallel to shear line. Light weight (about 50 pounds) means easy portability—in the shop or on the job, and sharpening expense is negligible. Best of all, it gives you...

**Heavy Duty Production
At Less Cost Than a
Foot Operated Shear!**



THE **LOCKFORMER** CO.

4615 W. ROOSEVELT ROAD, CHICAGO 50, ILLINOIS

the editor's notebook

(continued)

I used a neighbor's installation as my model for determining the size cover required. Taking the conditioner and window frame into consideration, balancing this information against other standard size conditioners and windows, I came up with what I thought were dimensions that could be used in fabricating a cover that would answer the requirements of most locations. From these dimensions I proceeded to lay out the various patterns for sides, top, bottom and end.

Up to this point, no effort had been made to keep track of the time spent in developing the pattern shape and size, but from the time the pattern was used to mark the metal, trim and cut, run seams and assemble the cover, it required $2\frac{1}{2}$ hours and an additional $\frac{3}{4}$ hour was required to cut and install the insulation. (I did the work in the shop of a friend on a Saturday; thus, all the latest tools, hand and mechanical, were available for this experiment.)

The time and material used indicated that such a sheet metal cover would have to be sold for about \$25.00 to provide a profit. This was disappointing to me because I realize that such a quality cover could be sold easily at about \$15.00 but doubt that any volume would be possible at \$25.00 without extended sales effort, which would add more expense to the item. I tell you about this to let you know we are always on the lookout for new markets. Incidentally, there is always the chance to make a gutter sale as a follow-up on any metal air conditioning cover. The cover I installed was located on the second floor and about 8 ft above the cover was a brick parapet with a baked clay covering.

fit 'em fast with CHAMPION

Take a tip from heating men who save time and dollars — in the shop and on the job — with precision-made, fast-handling CHAMPION fittings. Because they're machine fabricated, you're guaranteed fittings that go together fast and accurately . . . giving you a snug, good-looking installation every time. CHAMPION fittings are completely cartoned for economical shipping, easy handling, compact storage.

Remember, the CHAMPION line is *complete*. For any job . . . for *every* job, make more money with CHAMPION.



See Your Champion Jobber



CHAMPION

CHAMPION FURNACE PIPE COMPANY

211 Eaton Street

Peoria, Illinois

the editor's notebook

(continued)

Every time it rained or snowed and the snow melted, the drops of water falling on the metal cover resulted in it becoming a sound box. At times, it sounded in the room like someone was outside beating a drum. I cured this nuisance by installing a gutter along the edge of the parapet covering.

Growing Demand for Air Conditioned Schools

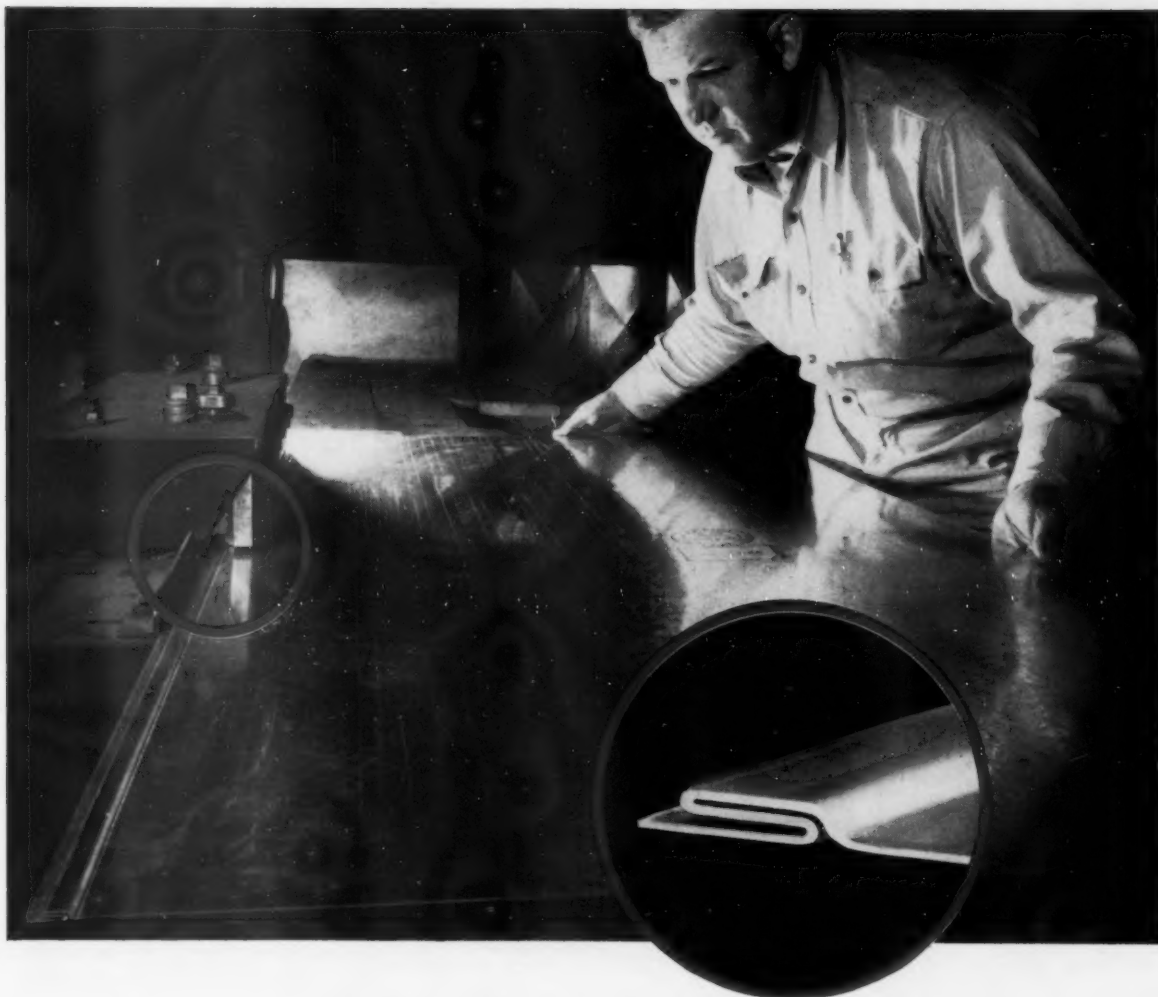
THE DEMAND for air conditioned school buildings is growing, and according to Z. A. Marsh, Minneapolis-Honeywell Regulator Co., the right comfort environment is most essential to good learning. At a recent meeting Mr. Marsh pointed out to over 100 educators that overheated classrooms make the pupils drowsy, inattentive and difficult to instruct.

We know that the heat generated in a classroom of 30 youngsters is enough to warm a five room house in freezing weather and that only through properly ventilated school rooms can we expect to get value received from the efforts put into training the pupils. This information should go a long way toward helping you sell warm air heating systems to the school boards now contemplating building new schools or adding to existing buildings.

If you run into any increase in promotion of electrical heating in your area, write me and we'll get together for a good look at the situation.

Small Businesses Still on Upswing

ALL THE NEWS about big companies buying out small businesses tends to make a person feel that the days of the small businessman are



You can lock form with ease with USS Galvanized Steel Sheets

Yes, lock forming becomes a simple, routine operation when you use USS Galvanized Sheets. They are easy to work and that's because they are *uniform* in ductility, flatness, surface finish, size and gauge.

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U.S. STEEL SUPPLY

DIVISION

General Offices: 208 So. La Salle St., Chicago 4, Ill.



Warehouses and Sales Offices Coast to Coast

UNITED STATES STEEL

the editor's notebook

(continued)

numbered, but according to a report I read recently he is not likely to expire anytime soon. The U.S. Department of Commerce has figures that show 79 percent of the firms engaged in retail selling employ less than four persons each. Thirteen percent of the retailers employ between four and seven persons each and six percent of the businesses employ between eight and 19 employees.

In other words, 98 percent of all retail firms in the country employ less than 20 persons each. The development of small businesses has not diminished either — over 133,500 new retail businesses were started during 1955. There were also 52,300 service businesses and 20,000 wholesale businesses started during this period.

Wholesale businesses are equally small in size, as indicated by the 63 percent that employ less than four people. Ninety-three percent employ less than 20 persons.

Rate 'Appreciation' Higher Than Pay

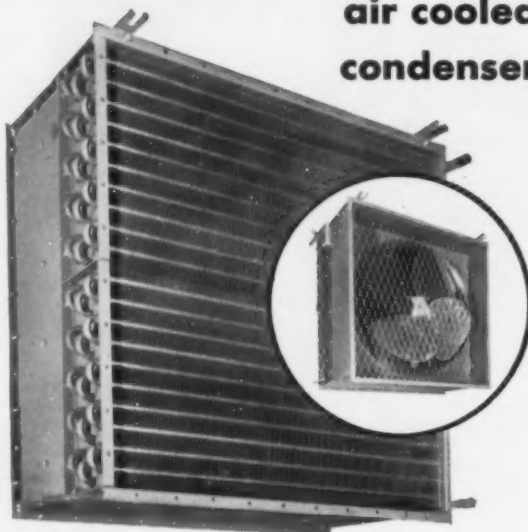
AN INTERESTING investigation of employee relations was recently undertaken by 24 industrial plants and I believe a study of the conclusions reached might well prove beneficial to dealers and contractors in our industry. The 24 companies asked employees to rate 10 morale factors in the order of their importance to the employee. This is how the employees listed them:

1. Full appreciation of work done.
2. Feeling "in" on things.
3. Sympathetic help on personal problems.
4. Job security.
5. Good wages.
6. Work that keeps you interested.
7. Promotion and growth.

END WATER PROBLEMS WITH LOW-COST HIGH-QUALITY

LARKIN ZEPHYRCON

air cooled
condenser



HANDLES UP TO 40 TONS AS EASY AS A BREEZE!

Here's the ideal air cooled condenser for residential and commercial air conditioning installations up to 40 tons. The Larkin Zephyrcon pulls the air over the condensing coils, assuring even air distribution and holding operating noise to a minimum.

The Larkin Zephyrcon is engineered with sufficient condensing capacity to solve your problem, yet it is economical to buy, install, maintain, and operate. See your wholesaler for details and specifications, or write direct to us.

FIVE MODELS WITH OUTSTANDING FEATURES

- 2, 3, 5, 8, and 10-ton units engineered for parallel use
- Famous Larkin cross-fin coil—aluminum fins, copper tubes
- Finished with corrosion-resistant epon-base, chlorinated-rubber enamel
- Permanently lubricated motors operate quietly on resilient adjustable base. Motors are provided with overload protection
- Motor wired to weather-proof external conduit box
- Fan guard is standard equipment
- Zephyrcon is weatherproofed for indoor or outdoor operation
- Slotted hanger bars for ceiling or floor installation



LARKIN COILS INC.

519 Memorial Drive, S. E. • ATLANTA, GEORGIA • MURRAY 8-3171

the editor's notebook

(continued)

8. Personal loyalty to workers.

9. Good working conditions.

10. Tactful disciplining.

It was interesting to note that foremen and other supervisors were also asked to rate the same factors in the order in which they thought the employees rated them. Here is what the supervisory group believed employee preferences would be:

1. Good wages.
 2. Job security.
 3. Promotion and growth in company.
 4. Good working conditions.
 5. Work that keeps you interested.
 6. Personal loyalty to workers.
 7. Tactful disciplining.
 8. Full appreciation of work done.
 9. Sympathetic help on personal problems.
 10. Feeling "in" on things.
- Note that the factors rated most highly by employees were way down on the supervisors' "guesstimate."

Does Customer Know What He's Getting?

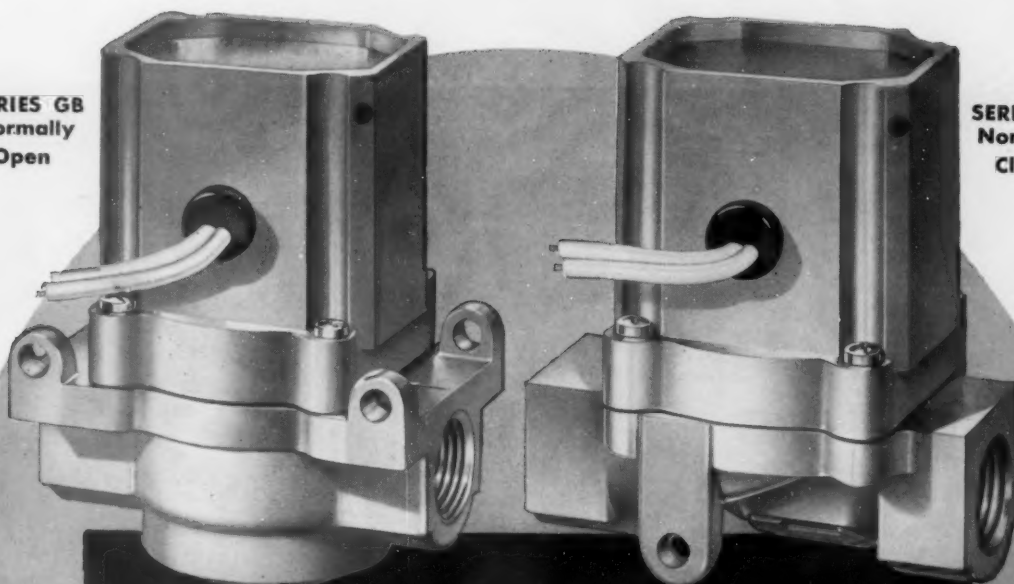
I KNEW it would happen! Recently the New Yorker magazine published a cartoon showing a 25-story building almost completed. The walls were fabricated from metal curtain wall panels containing an artistic design. At the lower right appeared the general contractor and the building owner. This comment served as a caption: "Now you tell us you don't like the pattern!" It serves to remind us that it is always advisable to give him a good idea of how the finished product will appear.

Clyde M. Barnes

EDITOR

SERIES GB
Normally
Open

SERIES GF
Normally
Closed



NEW, QUIET, MAGNETIC BASOTROL VALVE

MAGNETIC OPERATOR	Powerful a.c. electromagnet. Not a solenoid. Electrical parts not in gas stream.
QUIET	Molded rubber valve discs. No plunger to rattle and hum.
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SMALL	Fits into confined space.
TWO VOLTAGE TYPES	115-volt or 24-volt, a.c.; 3.6 watts, 0.05 a.
TWO MODELS	Normally Open for clock controlled gas range ovens. Normally Closed for clothes dryers and room heaters.
TWO TAPPINGS	Series GB, $\frac{7}{16}$ " Compression Coupling. Series GF, $\frac{3}{8}$ " F.P.T.
CAPACITY	Series GB, 52,000 Btu./hr. with Mfd. Gas. Series GF, 55,000 Btu./hr. with Mfd. Gas.



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For any warm air or wet heat system—oil, gas, or coal-fired—there's **one** right answer to every control problem. Just make it an all General Controls job. You'll find "extra profits" begin when you make that one-stop call at your nearby General Controls wholesaler to pick up a **complete** control package for the entire job.



GENERAL CONTROLS adds **PERFEX**!

General Controls now offers
complete control systems for air
conditioning and heating with oil fuels.



You get "better than ever" service... from a nation-wide, factory
trained field organization



Whatever your control need may be—a new application, an unusual service problem, or an aggressive selling program—a call will bring the help and experience of your local General Controls field representative. 5 plants, 7 regional warehouses, 42 branch offices—now serving the United States and Canada. Every help you need when you need it, near as your phone.



*For one complete line,
one responsible source and warranty—
specify General Controls
on every job.*

Five Plants:
Glendale, California
Burbank, California
Iron Mountain, Michigan
Skokie, Illinois
Guelph, Canada



GENERAL CONTROLS

Manufacturers of Automatic Controls for Home, Industry, and the Military

FORTY-TWO BRANCH OFFICES SERVING THE UNITED STATES AND CANADA
PERFEX CONTROLS AND GENERAL CONTROLS





Easier to sell...than sell against!

AMER-glas FILTERS are always in demand for furnaces and air-conditioning units. The reason—the original progressive pack filters, they trap dust and dirt *all through* the thickness of the pad and resist face-loading. Clean, whiter white replaceable filters, they are easy to handle—with no prickly slivers. That's because fibers are *continuous* filaments throughout the media. Here are filters that have passed every test and today are specified by leading man-

ufacturers of furnaces and air-conditioning units as original equipment for their products. So you will find it far easier to sell AMER-glas than ordinary filters. Follow the trend—and profit! The eye-catching counter display shown in the illustration is a powerful merchandising piece that is yours for the asking. Mail the coupon today for complete information on stocking and selling the *original* fast-moving, profitable AMER-glas FILTERS.



The original
"no prickly slivers"
filter.

New, free
dimensional
display.

A Filter For Every Need AMER-glas FILTERS are available in all standard sizes, of course . . . but if your requirements include a specially designed filter, you can depend on our staff of filter specialists to help you. Remember, AAF is the acknowledged leader in air-cleaning equipment.

Better Air Is Our Business



American Air Filter

COMPANY, INC.
Louisville 8, Kentucky

MAIL COUPON TODAY!

AMERICAN AIR FILTER CO., INC.
355 Central Avenue, Louisville 8, Ky.

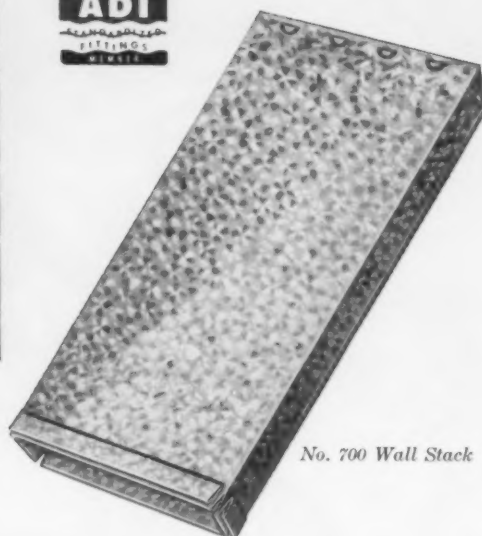
Please rush me complete information on selling the profitable line of AMER-glas FILTERS.

NAME

COMPANY

ADDRESS

CITY ZONE STATE



No. 700 Wall Stack

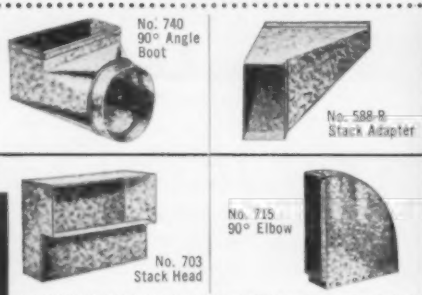
Milcor's famous Lock-Joint lets you
make quick installations at lower cost
 with **MILCOR® Forced-Air Fittings**

The Lock-Joint feature, exclusive with Milcor products, eliminates the need for screws, rivets and special tools. Milcor ducts, stacks and fittings simply snap together — and *stay* together.

Lock-Joint makes the installation of good-looking jobs quick and easy. It cuts your job costs and raises your profits. As far as performance goes, you can stake your reputation on Milcor Forced Air Fittings with confidence.

Prices and information are available from your jobber or our nearest branch.

B-137



MILCOR®

*the complete line
of galvanized
furnace pipe and
fittings*



INLAND STEEL PRODUCTS COMPANY

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BALTIMORE • BUFFALO • CHICAGO • CINCINNATI • CLEVELAND • DALLAS • DETROIT
KANSAS CITY • LOS ANGELES • MILWAUKEE • MINNEAPOLIS • NEW YORK • ST. LOUIS

Tests Show Series 200 Steels Easily Welded

TESTS INDICATE THE NEW chrome-manganese low nickel stainless steel (the 200 series) is as easily welded as the more widely known 301 and 302 steels. The tests were conducted by Allegheny Ludlum Steel Corp.

The tests, which were made on 16 gage sheets, showed in automatic inert arc welding it was necessary to have either higher heat or slower welding speeds per inch of weld in working on the 200 series as compared to the 300 series. The report further stated in the 200 series "clean welds were easily produced."

The 200 series stainless steels closely resemble the more widely known 300 series, but the newer series has about one-half the nickel content.

More Four-Day Short Courses Planned for 1957

PLANS FOR EXTENDING the four day college short course in warm air heating and summer cooling to as many as 20 colleges covering areas in all parts of the country were made at a recent meeting of the College Short Course Committee in Chicago. This committee is made up of members of the National Warm Air Heating and Air Conditioning Association and representatives of leading universities. Four day courses using the NWAHACA manuals were held this spring at Purdue University; Oklahoma A & M College; Long Island T & A Institute, University of the State of New York; University of Connecticut; Penn State College;

Michigan State College; and Syracuse University.

Programs have been planned for short courses at the above seven colleges during the spring of 1957. Other colleges where short courses are under consideration are the University of Texas, Austin; Georgia Institute of Technology, Atlanta; Washington University, St. Louis; Ohio State University, Columbus; University of Minnesota, Minneapolis; Mississippi State College, State College; University of California, Berkeley; Oregon State College, Corvallis; and University of Washington, Seattle.

Subjects to be included in the 1957 short courses will cover heating and cooling of split-level houses, year 'round air conditioning for slab floor houses, zoned and bypass air distri-

(Continued on page 22)

National ohi Campaign Gains in Popularity

THE OPERATION HOME IMPROVEMENT idea is gaining in popularity, if recent predictions are an indication. It's estimated that more than 14,000,000 American households will make one or more improvements on their dwellings within the next 12 months, the Chamber of Commerce of the United States reports.

Sponsored by the national Chamber of Commerce and supported on the national level by dozens of trade associations, manufacturers and retailers, Operation Home Improvement has set up two major goals: 1) to interest more people in improving their homes and 2) to help make it easier for home owners to buy materials and services.

The movement was opened officially January 16 when Albert M. Cole, housing and home administrator, proclaimed 1956 as the year to fix up and improve the home. Since that time more than \$5,000,000 worth of national advertising has been

spent to publicize the movement, the national chamber states.

Since ohi got its official sendoff, cities from coast to coast have inaugurated local programs which have been tied in closely with the national campaign. A local level manual has been prepared by national headquarters in New York telling local groups how to get a movement started in their area. Kits which include advertising copy, the ohi emblem, decals and other advertising material have been assembled for sale to business men interested in taking part in the ohi program.

Estimated in dollars and cents, economists a year ago said the new potential in home improvement would be about \$12 billion more than in 1956 alone, according to the national chamber. Current estimates put the figure at 25 to 50 percent higher. By 1960 the home improvement business should be double the present rate, the chamber report states.

Ask Revision to Simplified Practice Recommendation

A PROPOSED REVISION of Simplified Practice Recommendation R207-54, Pipes, Ducts and Fittings for warm air heating and summer cooling, has been submitted to producers, distributors and users for review and acceptance, the Commodity Standards Division, Office of Technical Services, U. S. Department of Commerce reports.

The recommendation, consisting of a simplified list of pipes, ducts, and fittings for warm air heating and summer cooling was first issued in 1945. It was revised in 1949, amended in 1952 and revised again in 1954.

The proposed revision considers the changing trend to forced warm air heating replacing gravity systems. Some changes in nomenclature have also been made to conform with the terminology now being used by the heating industry.

SAY, J. P., HOW'D YOU EVER
MAKE SO MUCH MONEY IN
THE FURNACE BUSINESS?

Well, Sam . .



... I'll Tell You . . .

"Things weren't goin' too well for me until I found out that handlin' Armstrong Furnaces and Air Conditioners is the surest way to a fat wallet. Armstrong sells *quality*, and sells it good! There's a lot of home heatin' equipment around, but none with the solid engineering and design that make Armstrong furnaces such big sellers. Folks *want* quality, and I can give it to them in Armstrong furnaces. Bein' an Armstrong dealer has lots of other advantages, too. I learn plenty at the dealers' schools, and the Armstrong promotional material is a terrific boost . . . really helps get the story across to my prospects. My Armstrong wholesaler takes care of all my warehousing, so my shop isn't crammed full of furnaces. And Armstrong's complete line of furnaces and air conditioners makes any home owner my prospect. Yes sir, being an Armstrong dealer sure is the way to get on top in this business!"



"**Say,** with Armstrong, I can have a business like yours. I'm gonna call that Armstrong wholesaler right now!"

And why don't you? Your Armstrong wholesaler can give you the whole money-making Armstrong story. Call or write today.

Yep, it sure is nice bein' an Armstrong dealer.

just look at all these advantages...

- * A complete line of furnaces and air conditioners
- * Wholesalers who do your stocking for you
- * National advertising in top consumer magazines
- * Prospect-catching promotional material
- * Service and product meetings in the field
- * Dealers heating and air conditioning schools at the factory

* And you're selling quality equipment



YOUR ARMSTRONG WHOLESALE

Armstrong Furnaces

AND AIR CONDITIONERS
COLUMBUS 8, OHIO

ready to assist you . . . all-ways

Kalamazoo Plans Revision Of Heating, Cooling Code

A REVISION OF THE WARM AIR heating code used in Kalamazoo, Mich. has been underway since September 1955. The code committee, headed by Glen Rynbrand, has endeavored to incorporate in the revised code provisions to cover room air conditioning, central residential air conditioning systems, the heat pump and electric panel heating. It is expected that the revised code will become a model code.

A rough draft of the code was issued last fall to all interested parties with the request that suggestions and criticisms be turned over to the code committee. More than 500 different comments were made. They are now in the process of being evaluated, and, according to A. F. Madaus, Mechanical Equipment Inspector, City of Kalamazoo, about 75 percent of the suggestions will be incorporated in the final draft which is expected to be ready about August 1, 1956. Copies will be made available at \$5 each to other committees.

The new code will require that all cooling equipment be rated in Btuh, also that no cooled air be passed through the heating section of a year 'round system. Other requirements in the new code will deal with the

use of anti-freeze solutions for heat pumps using water as the heat source. The discharged water from water cooled cooling units will not be dumped into the sewer system, and only under special arrangements will permission be granted to use storm drains.

The use of electric panels as heat sources will require that outside air be supplied at a rate of 4 cfm per person where the volume of the building is less than 1000 cu ft per person.

Building Awards Sets New April Record

CONTRACT AWARDS FOR future construction soared to \$2,421,497,000 in 37 eastern states for April, according to the F. W. Dodge Corp., construction news and marketing specialists. This was a record April, increasing the April, 1955 figure by 4 percent, and the second highest figure in history.

A new first-four-month-record of \$8,521,369,000 was established, a 13 percent increase over any other four-month period. The residential awards also set a record of \$1,144,160,000, up 7 percent over the April, 1955 total.

A C Owners in St. Louis To Use Water Meters

WATER COOLED air conditioner owners in St. Louis will get their water service through meters rather than on a flat rate, the St. Louis Better Business Bureau reports.

The reason for this, the bureau says, is to provide for fair equality in charging for the use of water. Each customer will be charged for the amount of water used during each pay period.

Americans Buy Larger Homes, FHA Reports

AMERICAN FAMILIES WANT and are getting larger homes under the Federal Housing Authority program, according to an FHA report. The area of the new home in which the FHA insured a mortgage in 1955 averaged a little more than 1020 sq ft, compared to a home averaging 838 sq ft in 1950 and 924 sq ft in 1953. This increased even more in 1954 to 961 sq ft. Also, the average home in 1955 had five and a half rooms with three bedrooms, but the three bedroom house was more popular in 1954 than last year. Average value of homes purchased last year with FHA insured loans was \$11,750 and carried a mortgage of slightly more than \$10,000. The average monthly payments were \$74 on the mortgage, including payments to principal, interest, property taxes, hazard insurance and FHA insurance premium.

Storage for Gas Industry Passes Two Trillion Mark

TOTAL STORAGE RESERVOIR of the gas industry passed the two trillion cubic feet mark during 1955, according to the American Gas Association's fifth annual statistical report on underground storage in the United States. The total reached 2,095,814,139 mcf (thousand cubic feet) in 1955, for an increase of 237 million mcf over 1954.

Both total output and input for the year ending October 31 increased in 1955. The total output was 352 million mcf, an increase of 48 million mcf over the previous year and was 152 million mcf over 1951. The total input to storage for the year 1955 was 503 million mcf, an increase of 71 million mcf over the previous year.

The annual report was prepared for the American Gas Association committee on underground storage by its subcommittee on statistics.

More Colleges to Offer Short Courses in 1957

(Continued from page 19)

bution systems, and perimeter heating for large buildings. Students will be given a choice of one of three projects to be completed in the classroom sessions. These projects will deal with 1) heating a small house (with or without a basement); 2) split-level or ranch style house heating and cooling; 3) year 'round air conditioning for a medical clinic building.



LEADERS RELY ON LAU

25 Years Building Better Blowers

Manufacturers of air-moving equipment know that Lau has led the field consistently in the development and manufacture of blowers and blower parts. Each component in our products is the result of painstaking engineering and testing. As improvements can be made Lau makes them.



HERCULEAN HOUSING



THE LAU BLOWER COMPANY

2000 Home Ave. • DAYTON 7, OHIO

Other plants at Kitchener, Ont., Canada, and Azusa, California

This original LAU design has set the pattern for the industry. Of heavy gauge steel, with beading reinforcements around discharge opening to assure uniform size, shape and strength. The offset in scroll sides gives better support to the bearing bracket and allows smooth air flow for maximum blower efficiency. Motor mounting holes are pre-punched for all angles of discharge. The specially designed cut-off is built for extra strength and is permanently fastened in four places. Plated hardware throughout.

The entire unit is die-formed, lending itself to mass production on precision built equipment. Finished in highest grade baked enamel. Wide range of sizes available.

LB-5, 56



SERIES "A"
BLOWER



ELECTRO-WHEEL
BLOWER



LAU-PAK
BEARING



SERIES "A"
WHEEL



WELD
WHEEL



LAU STEEL
PULLEY



BEARING
BRACKET



PANEL
FAN



RANCHER
FAN

WORLD'S LARGEST MANUFACTURERS OF AIR-CONDITIONING BLOWERS

CREATE

planning the system with your prospect

in **15**
...a
complete plan



CONFIDENCE

using the amazing *Airline*

BORG-WARNER

easy and accurate formula

Here's BIG News for every contractor who has ever made a bid on heating and air conditioning installations and then worried for fear he might have tried to cut corners a little too close. Ingersoll Conditioned Air and the Research Department of Borg-Warner, working together with outstanding authorities from all over the United States, have developed a simple, foolproof estimating formula for both heating and air conditioning. In 15 minutes or less you can sit down with your prospect and work out the heating and cooling load for his home. You can tell him the exact units he will need for effective heating and cooling, the size ducts to be used, the number of outlets necessary — and best of all the exact price the whole package is going to cost.

THIS IS JUST ONE OF THE MANY NEW THINGS THAT WILL BE COMING YOUR WAY FROM AIRLINE THIS YEAR. INVESTIGATE THE OPPORTUNITIES OFFERED YOU BY SENDING IN THE COUPON BELOW.

EVERYTHING IN ONE PACKAGE

Ingersoll salesmen are out calling on dealers right now to give them the picture on the most revolutionary development in the industry in years. It means more profits for you, fewer problems to handle, greater success as a businessman. Don't miss this opportunity of a lifetime. Demand to see the new Airline Presentation!



Airline
BORG-WARNER

CONDITIONED AIR EQUIPMENT
HEATING and COOLING



Tell me more about the Airline Plan.

Name _____

Company Name _____

Address _____

Date Airline Representative should call _____

INGERSOLL conditioned air division
BORG-WARNER CORPORATION
Kalamazoo, Michigan



Don't get nicked by the "PRICE SHAVERS!"

It doesn't pay to lose your head . . . and your profit . . . in an attempt to shave your prices as close as the "price talkers" who have nothing else to offer. If you handle Perfection Regulaire warm air furnaces, you can sell builders *without price cutting* and at a good legitimate profit because they get a *guaranteed*

extra profit on every house. Why? Any house equipped with a Perfection Regulaire furnace brings a *higher* loan appraisal. And you have an added attraction with Perfection's new, workable, home selling promotion . . . the "Guaranteed Comfort" home. Only Perfection dealers can offer it.

You sell the replacement business without shaving your profit!

Perfection's Regulaire and 3-stage fire gives your prospects an incentive to buy that the "price talkers" can *never* approach. And Perfection's new down-to-earth "kitchen table" sales tool makes it clear in no uncertain terms why it pays to buy from a Perfection *guaranteed* dealer. So, talk to Perfection. Perfection Industries, Division of Hupp Corp., 7705-D Platt Avenue, Cleveland, Ohio.

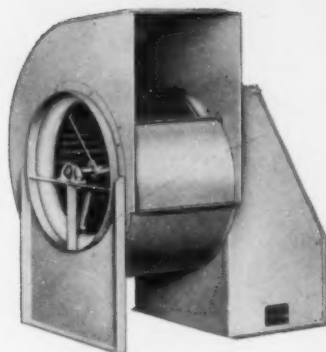


TALK TO

Perfection

AUTOMATIC HEATING • SUMMER COOLING • HEAT PUMPS





**DOWN
TO**



ON A BUY IN THE SKY

Let's face it: isn't it time something was done about "the forgotten fan?" Tucked away on the roof — but **not** out of harm's way — it takes a grueling beating from wind and the weather. If maintenance isn't up to snuff, it frequently breaks down from exposure and lubrication neglect.

Utility has the practical, down to earth solution: a complete series of Enclosed Drive Blowers designed for outdoor service, all with completely enclosed motors and drive to protect them against dirt, moisture and drastic temperature changes. Lubricated for life with permanently sealed, pre-greased ball bearings, they'll never break down from lack of proper maintenance.

This achievement in creative engineering is one more excellent reason to recommend Utility Enclosed Drive Blowers to meet every specification, be in line on every bid. Next job, plan with Utility to keep costs down while delivering the absolute maximum of outdoor service!

UTILITY FAN CORP. 911 East 59th Street, Los Angeles 1, California



Manufacturers of heavy and standard duty blowers for heating, air conditioning and ventilating installations. Producers of blowers and blower parts for original equipment manufacturers. Write for catalogue data.

A Division of Utility Appliance Corp.

any shape...any size...
any kind of ductwork
is better with
galvanized steel...
is best with

WEIRKOTE

In manufacturing ductwork, galvanized steel has long been relied on for ease and economy of fabrication . . . also providing maintenance-free long life.

But now, ever more fabricators are turning to Weirkote to do the job. Why? . . . Because Weirkote is the superior galvanized steel sheet, produced by the most modern continuous galvanizing process . . . quality-controlled from start to finish. It has the tightest of tight zinc coatings . . . resists cracking, peeling, flaking and, above all, corrosion as does no other metal for ductwork of proved durability. Weirkote is far stronger, more rigid, more heat-resistant. These are only a few of the reasons why we say: In the long run, galvanized steel . . . in the LONGER run, WEIRKOTE. Let Weirton show you why!

WEIRTON STEEL COMPANY

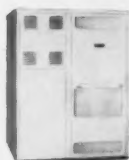
WEIRTON, WEST VIRGINIA
a division of

NATIONAL STEEL CORPORATION





2 or 3 Ton Year 'Round Unit. Burns Gas or Oil. Air or Water Cooled.



2 or 3 Ton Counterflow Year 'Round Unit. Burns Gas or Oil. Air or Water Cooled.



5 Ton Year 'Round Unit. Burns Gas or Oil. Air or Water Cooled.



Self-Contained, Water Cooled Commercial Air Conditioners. 3 to 15 Tons

WITH

Luxaire®

YOU MAKE

More Money

WITH Less Money!

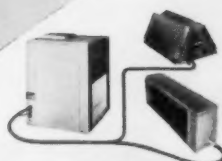
Utility Type Winter A. C. Unit. Burns Gas or Oil.



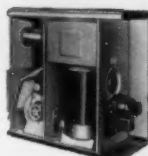
Gas Fired Incinerator



Water Cooled Add-On, Summer A. C. Unit. 3 and 5 Tons.



Air Cooled, Add-On Summer A. C. Unit. "V"-type or Flat-type Cooling Coil. 2, 3 and 5 Tons.



Basement Type Winter A.C. Unit. Burns Gas or Oil.

Gravity Furnace Burns Gas or Oil.



Gas Unit Heaters. 5 Compact Models.



Horizontal Furnace. 4 Gas Fired Models. 4 Oil Fired Models.



Excellent Units

More Complete Line

Lower Prices

Greater Profit

Look at the Luxaire line of heating and air conditioning equipment — every unit is a deluxe unit, at a down-to-earth price!

Luxaire Gas Furnaces, up to and including most 100,000 Btu input models, are shipped completely assembled and wired. All Luxaire Furnaces, with 100,000 Btu input or over, burn either Gas or Oil with equal efficiency. And Luxaire Year 'Round Units are either Air Cooled or Water Cooled.

Horizontal, Counterflow, Utility or Basement Furnace, the price is more than competitive. With capacities from 65,000 to 280,000 Btu, you have a size for practically any job.

Whether you need heating units or cooling units, see your Luxaire jobber!

THE

Luxaire

C. A. OLSEN MANUFACTURING COMPANY • ELYRIA, OHIO

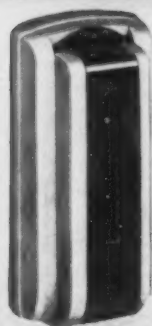
HEATING & AIR CONDITIONING UNITS



HEATING CONTROLS



G-E LINE OF HEATING CONTROLS GIVES



NO LEVELING thermostat is designed for a wide variety of heating applications and is available to heating equipment manufacturers in a variety of decorator colors.



NO ADJUSTMENTS are needed with G-E master control which is adjusted permanently and expertly at the factory. Only seven contacts assure dependable operation.

**TOP
SOLD
SALE**

GENERAL ELECTRIC ANNOUNCES...

NEW, Low-cost, Outdoor Control System with Wide Consumer Appeal

UNIQUE G-E OUTDOOR THERMOSTAT INSTALLS EASILY, CAN HELP INCREASE YOUR SALES OF HEATING EQUIPMENT

The General Electric Appliance Control Department's new outdoor control system regulates indoor temperatures with an indoor-outdoor thermostat arrangement—and costs from 50 to 70 percent less than electronic systems. The simplified G-E system provides the ultimate in modern home comfort by constantly adjusting the indoor temperature in relation to the temperature outside. In operation, the outdoor thermostat tips off the indoor thermostat to changing weather conditions.

Heart of the G-E outdoor thermostat is a small wafer of carbon that senses weather changes, then sends a minute electrical signal, via a 25-volt transformer, to the indoor thermostat. Thus, warned in advance, the indoor thermostat signals the furnace to deliver more heat.

SIMPLICITY in design drastically reduces maintenance and the G-E control system installs quickly. It gives home owners healthier living conditions at the first practical, inexpensive price in the industry.

HEATING EQUIPMENT equipped with the new G-E outdoor control system, and other G-E heating controls, can open the door to greater sales in the ever-expanding new home construction market.

FOR FURTHER INFORMATION contact your nearest General Electric Apparatus Sales Office or clip and send in the coupon below.

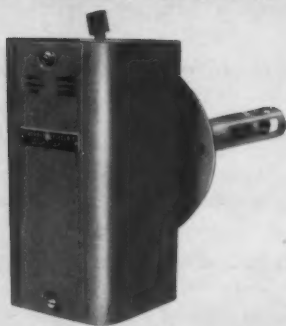


INDOOR THERMOSTAT has a compensating resistor mounted in back of bimetal blade and is connected in series with outdoor thermostat being installed at left.



25-VOLT TRANSFORMER completes the simple circuit of the G-E outdoor-indoor system and the current produces artificial heat inside the room thermostat.

COMPLETE CUSTOMER SATISFACTION



THE SAME SWITCH for both fan and limit functions simplifies servicing of the combination fan and limit control. This control is suitable for use with oil-, gas-, or coal-fired systems.



DEPENDABLE IMMERSION control is used to control water temperature. Available either normal acting or reverse acting. Bimetal assembly can be removed easily for inspection.

SECTION F740-99
GENERAL ELECTRIC COMPANY
SCHENECTADY 5, N. Y.

Please send me the following detailed bulletin(s)
GEC-1030 Domestic Heating Controls
GEC-1352 Outdoor Control System

Name.....

Company.....

Street.....

City..... Zone..... State.....

GENERAL  ELECTRIC

THE MARK OF QUALITY



uni-flo

Engineered
Air Distribution

Venturi-Flo Diffusers "make air behave" in this new Florida church



New Southside Methodist Church*, Jacksonville, Florida, combines traditional beauty (lower right) with the best in modern indoor weather engineering. Note Venturi-Flo Ceiling Diffusers in both sanctuary (left) and chapel (upper right). Air temperature is maintained by Barber-Colman Automatic Controls.

Performance of Venturi-Flo Ceiling Diffusers and Uni-Flo Return Grilles is guaranteed when they are used according to published data. High rate of aspiration for efficient air distribution . . . minimum ceiling smudge in year-after-year operation . . . rugged construction. Deflection and opposed-blade volume controls easily adjustable after installation. Barber-Colman can readily provide means to suspend light fixtures from the diffusers. Contact your nearby Barber-Colman Field Office, or write . . .

*C. E. McCallum, Mechanical Consultant
for Barber and McMurry, Architects
and Engineers, Knoxville, Tennessee

Barber-Colman Company

DEPT. G, 1104 ROCK STREET, ROCKFORD, ILLINOIS, U. S. A.

WASHINGTON LETTER

THE CONTROVERSY OVER CREDIT controls wages hotter than ever since the Department of Commerce published in May the 1955 public and private debt figures. The government agency shows the gross public and private debt increased by \$61 billion, more than any other peacetime year, to \$768 billion. Most of the controversy came as a result of the April advance from $2\frac{1}{2}$ to $2\frac{3}{4}$ or 3 percent in Federal Reserve Bank discount rates, an action intended to retard the expansion of debt and to counter rising prices which come from excessive borrowing.

Critics of the discount rate, who come from many quarters, claim tight money would deprive business of essential credit requirements and precipitate a slump in products and employment. Others say with the tightening of the mortgage market, the number of new homes built this year might fall far short of the 1,400,000 target set by the Housing and Home Finance Administrator. Still others think the small and marginal businesses may be deprived of credit and go under.

And the cost of borrowed money is higher. Interest-bearing securities and savings accounts are paying higher rates and lenders have been turning away applicants for loans, especially when the loan is to finance a project of dubious merit or where the borrower is trying to do too much with other people's money and not enough with his own.

At the same time banks have put through more loans so far this year than ever before in a January-May period, partly by selling investments, partly by working harder to get deposits and partly by borrowing from Federal Reserve Banks. For the weekly reporting member banks of the Federal Reserve System, over the six weeks following the mid-April discount rate advance, business loans increased \$410,000,000, compared to a rise of \$98,000,000 in the corresponding period of 1955.

BUSINESS SPENDING FOR NEW plants and equipment is scheduled to rise by an annual rate of \$2 billion in the third quarter, according to a survey conducted by the U.S. Department of Commerce.

A steady upward progress in investment outlays was shown by an earlier study, and now this rise has been extended for another quarter. The expectations when announced in March seemed high, but now the new survey has reconfirmed this optimism with possibilities of a record year for investment spending.

Another point brought out in the survey shows that employment for May was 65,000,000, a record for that month and close to the all-time record of 65,500,000 which was set last August. The May employment figures are 1,000,000 over April's figures, and the unemployment

for May was about the same as for April.

In announcing the completion of the survey, Secretary of Commerce Sinclair Weeks made two observations. First, he pointed to the necessary pauses from time to time for business to regroup and consolidate gains. "There is still a thing called the business cycle, which affects different industries at different times and in different degree," Mr. Weeks said. "The present leveling off of total business, therefore, was not unexpected. Nevertheless we never have been on a higher level than now."

Second, Mr. Weeks recalled the long-term goal of a \$500 billion economy for 1965 as set up last year by President Eisenhower, which is considerably closer than when the President first made his statement.

THOUGH THE LENDING controversy continues, money lending agencies enjoyed a prosperous 1955 with the home improvement appeal alone, according to the Federal Housing Authority. More than a million issued loans for property improvement, totaling \$645,000,000, were made last year, bringing FHA issued loans to a total of \$9,000,000,000 since 1934. The typical loan issued in 1955 gave the borrower net proceeds of \$464 to be repaid in monthly installments to principle and interest of \$14.83 over a three-year period. Nine out of ten loans issued during the year paid for improvements to single-family homes.

Insulation work was the improvement most frequently financed by the FHA, 18 percent of the loans going for this type of work, but heating improvements trailed close behind with 15 percent going for installation of new systems or repair of the existing heating systems.

Broken down into states, more than 114,000 of the 1955 loans were issued in New York. Michigan and Texas followed close behind with 75,000 each, Ohio had 64,000 and Illinois 61,000. National and state banks continued to be the chief originators of insured property loans, though the percentage dropped from 83.9 in 1954 to 78.7 percent last year.

Finance companies helped to pick up the slack left by the banks by issuing 9.2 percent of the loans in 1955, an increase of 2.2 percent over 1954. Repayment by borrowers improved last year. Claims paid by the FHA on property improvement loan insurance in 1955 totaled about \$18,000,000—a decrease of one-sixth from the \$21,000,000 paid in 1954.

Rules and regulations signed recently by FHA Commissioner Norman P. Mason will authorize the FHA to issue more insured home mortgages. Public Law 574 authorizes the FHA to insure home mortgages for es-

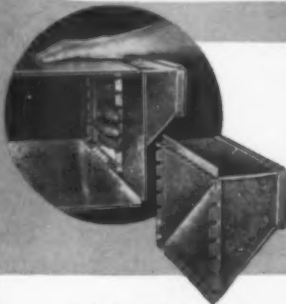
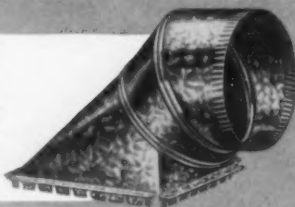
**You Make More
Because You Get More With
ADELTA
STANDARDIZED PIPE,
DUCT AND FITTINGS**



**the one-piece snap
lock cleat with
tapered leading edge**
an original Adelta idea
that saves assembly
time for you

**the universal
adjustable take-off**

an original Adelta idea
that saves your hand-
ling so many different
types of take-offs



**the pre-notched
collar edge**

an original Adelta idea
that eliminates notching
and hammering on all
collar connections to
speed assembly

**Original Adelta ideas plus the finest in
pre-fab pipe, duct and fittings, Adelta
cartoning, in-stock service and our help
whenever you need it means you'll
make more profits on every heating
and air conditioning installation.**

**See your jobber or write, wire or call
us direct.**



ADELTA MANUFACTURING CO., INC.

**21st & Ellsworth St., Phila. 46, Pa.
PEnnypacker 5-7843**

WASHINGTON LETTER —

(Continued from page 33)

sential civilian workers at armed forces research or development centers.

Mr. Mason, expressing his pleasure that the FHA is now able to assist in housing the technical personnel needed at military research facilities, pointed to such places as the Army installation at Huntsville, Ala., the Air Force base at Cocoa, Fla. and the Navy installation at China Lake, Calif., as especially needing housing.

For the first time the new law provides a home ownership program for Defense Department employees under the provisions of Title VIII of the National Housing Act. Previously Title VIII provided federal mortgage insurance for rental housing only. Substantially the same as FHA's standard home ownership program, the new provisions make an important distinction. PL 574 drops "economic soundness" as a requirement for eligibility of housing for government mortgage insurance. FHA will be furnished a certification by the Department of Defense for the need of a specified number of housing units in the critical areas.

A STRONG RECOMMENDATION for the expansion of private home building for housing older persons was approved recently by delegates of the Federal-State Conference on the Aging. The recommendation came out of a special committee on housing and living arrangements for elderly people.

Part of the recommendations called for the production of small, suitably designed houses built by private industry and utilizing the liberalized provisions for Federal Housing Administration mortgage insurance.

It was pointed out that homes should not be built for older people as such but should be well-designed to include special features such as hand rails and a minimum number of stairs. They would be small homes, attractive and saleable to any small family seeking a modest-sized home.

One big consideration in the proposed plan is the use of heating. Special care must be taken in this category since the homes would be occupied by older people who prefer higher temperatures to keep comfortable.

Other suggestions included: to hold state-wide meetings to be called to study the housing needs of the aged in their own states; to amend social security legislation to allow assistance if the aged person is living in tax-supported dwellings, such as county homes; building small homes and apartments for older people facing retirement who are living in larger homes; careful planning by communities considering projects for older people to include services such as recreation, nursing care and hospital facilities; and broad efforts to make available to the aging residence and settlement requirements of the various states, so that they will not lose assistance and other rights.

NEW!

single-stage unit

two-stage unit



THE
WEBSTER

"Service Saver"
REVOLUTIONARY NEW FUEL-UNIT

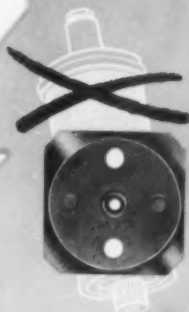
● **New filtering principle eliminates screens—No clogging—No cleaning**

● **Interchangeable with any fuel-unit now on the market—without troublesome connection changes**

WEBSTER

"Service Saver" FUEL-UNITS

-the Unit You Said You Wanted



This rotary cleaner
replaces filter screens
in the "ServiceSaver"
—ends clogging
and cleaning

Webster's revolutionary new "ServiceSaver" was built to meet the demands of servicemen. It eliminates the principal cause of customer complaints and unprofitable service calls—clogged filter screens.

No Filter Screens!

"ServiceSaver" requires no cleaning. It uses an entirely new compact, light-weight, self-cleaning, rotary-type filter which completely eliminates the usual wire mesh strainer. Rated by Underwriters Laboratories up to 14 GPH.

Completely Interchangeable

You can use Webster's new "ServiceSaver" to replace any pump now on the market—without troublesome connection changes.

Single or Two-Stage

Two separate models—single-stage for gravity applications and a self-priming two-stage unit for lift applications.

Quick Conversion

Change from one-pipe to two-pipe system in seconds without additional parts.

Unlimited Flexibility

You can rotate the "ServiceSaver" 360° and make the connections where they are easiest to reach. Extra ports provide a wide variety of options in making connections.

**Get all the details on this amazing new unit!
Write for Bulletin A9A1**

WEBSTER ELECTRIC



RACINE
WISCONSIN

MANUFACTURERS OF FUEL-UNITS, IGNITION TRANSFORMERS AND DELAYTROLS

LITHO IN USA D&J-56



**Idea Exchange
for
Dealers, Contractors**

Open House Builds Prospect List

TO CELEBRATE the completion of a new annex to his present shop for housing a showroom, Sam Dick, heating and cooling dealer of Warren county, N. J., issued written invitations to customers and prospects living within a 25 mile radius. The company, Sam Dick & Son, is located on the main highway that passes through the town of Hope, N. J. and as is the custom of dealers serving the rural areas, must carry a large inventory of repair parts as well as replacement equipment. To let the public know about the extent of his services, Mr. Dick decided the formal opening should be in the nature of an evening party to be the most effective way to announce the completion of the annex.

The invitation list included the mayor of Hope, the fire chief, chief of police, a minister of one of the churches, the local banker and many of the other prominent business men of the community and their wives. The party was held in the new wing which was decorated with colored streamers and balloons. Refreshments were served all evening.

Badges Identify Visitors

Because people came from many different areas, a number of them didn't know each other. To solve this problem each person received a badge with his name printed on it. Soon there were no strangers.

The decision to build a showroom in a rural location was not an easy one to make according to Mr. Dick. To help him reach a decision, he



NO LONGER STRANGERS, visitors from 25 mile radius enjoyed evening open house, saw selling displays of heating and cooling equipment

made it a practice during the past three years to bring into each conversation with a prospect or customer some comment that might reflect the feeling of the individual as to whether he would have liked to come to his place of business to examine the furnace, conversion burner, water heater, cooling unit or other equipment handled before he decided to make his purchase.

Knowing that it is often necessary for home owners to drive long distances to reach a showroom in order to inspect his merchandise, he had to be certain an expenditure of the amount needed to build the annex would be returned by an increase in sales volume. The remarks made by

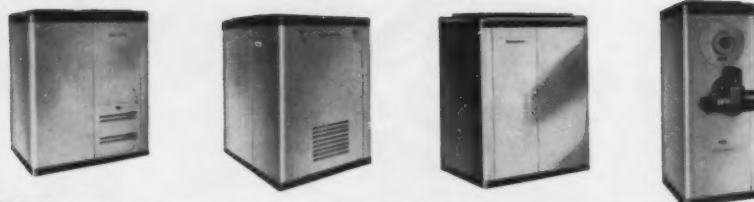
prospects indicated that an increase in sales volume could be expected.

Future Transactions Foreseen

Mr. Dick was quick to point out that the invitation to the banker was not for mercenary purposes but he did get the feeling that those applying for modernization loans for work to be done by the company would be looked upon with considerable favor by the local lending institution.

The company keeps six mechanics busy the year around, with the installation and service work being supervised by Stanley M. Dick, the son. Sam Dick spends his time keeping the company's sales rolling in.

Gasaver and
Oilsaver Furnaces



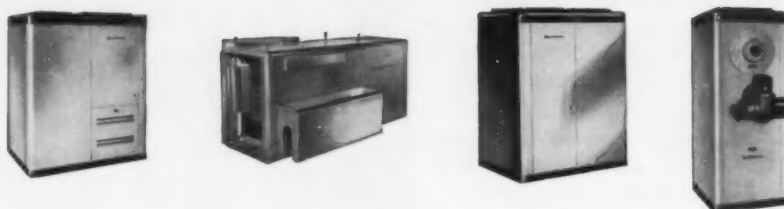
for the industry's most

DeLuxe Gas
& Oil Furnaces



complete line of heating and

Super Gas,
Oil & Coal Furnaces



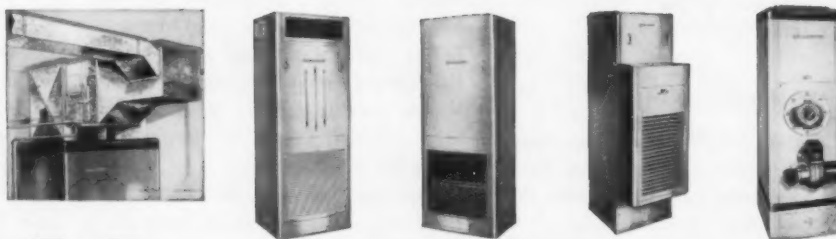
cooling equipment backed by

Special Gas
& Oil Furnaces



strong consumer promotion . . .

Wethermatic
Airefrigeration
Waterless Cooling Units



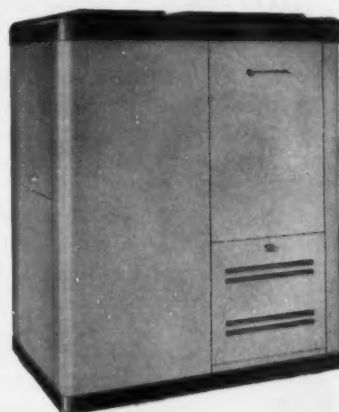
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WILLIAMSON



Blue-Gray Metalescent Finish

- *New Designs*
- *New Models*
- *New Colors*



Two-tone Hammer Finish Green



Gleaming White Enamel



As Advertised in Leading Magazines

THE WILLIAMSON COMPANY

3310 B-7 Madison Rd.

Cincinnati 9, Ohio

Gentlemen:

Please send me information on the following:

- ☐ Heating Equipment
- ☐ Cooling Equipment
- ☐ Duct, Pipe and Fittings

Name.....Title.....

Firm.....

Address.....

City.....Zone.....State.....

WHAT THE ASSOCIATIONS ARE DOING



THERE'S STANDING ROOM only at the dealer management conference where an opportunity to obtain information on specific industry problems was offered to delegates

Dealers Choose Their Subjects At OHI Convention

DEALERS ATTENDING THE 34th annual Oil-Heat Institute of America convention in New York, June 11-14 were able to select subjects of their choosing for discussion at the dealer management conference. Subjects such as credits and collections, service contracts, selling heating equipment, sales promotion, advertising, sales training, increasing office efficiency, service management and radio communications were discussed at the round table forum. Each subject was under the supervision of a leader who is well informed in his specific subject.

'Impending Event' Approach Recommended

Dealers interested in more than one topic could move from table to table. One of the points brought out at the "selling heating equipment" table suggested the "impending event" approach be used more frequently. C. W. Whitney, discussion leader, said, "The impending event approach will help speed up the heating system prospect's decision to buy if the salesman will point out,

'if you order today, you will be making a considerable saving on the cost of the equipment because prices are higher in the fall when the installation season is at its peak.' The substitution of similar phrases will make the impending event approach adaptable to year 'round use."

At the sales training clinic, Ray Horan, discussion leader, pointed out that a salesman will work more effectively when the dealer publicly recognizes an accomplishment he has achieved over and above the usual routine. Mr. Horan recommends a plan be made and followed to give recognition of salesmen's work at periodic intervals.

Merchandisers Create Desire

In the sales promotion clinic, discussion leader K. Shivel said, "Anybody can give something away; it takes a good merchandiser to make people want something enough to pay for it." The discussion outlined several ways to develop sales interest and recommended that dealers utilize the sales aids provided by manufac-

WITH THE ASSOCIATIONS

(Continued)



OHI'S ALADDIN LAMP AWARD is made to George Hochstein, president of OHI, by Frank P. Scully



DISCUSSING THE EXPERIMENTAL work being done at Battelle Institute are: (l to r) Abbott A. Putman, David Locklin and R. B. Engdahl

turers because they have larger staffs to work out the details involved.

The election of officers saw George E. Hochstein elected president for a second one-year term. C. T. Burg and P. G. Crewe, vice presidents, also were reelected and will serve additional terms. J. Verne Resek was elected vice president for his first term. Elected as directors were:

Manufacturer Division—Paul K. Addams, Fitzgibbons Boiler Co., Inc.; Walter Blake, U. S. Machine Div., Stewart-Warner Corp.; R. S. Bohn, Preferred Utilities Mfg. Corp.; Frank Brophy, Burnham Corp.; C. T. Burg, Iron Fireman Mfg. Co.; J. W. Cowan, Ace Engineering Co.; Shep Doherty, National-U.S. Radiator Co.; William Gaskell, Bryant Div., Carrier Corp.; R. B. Gilbert, Rheem Mfg. Co.; J. M. Gleason, Eureka Williams Corp.;

Rupert H. Gustafson, Sundstrand Engineering Co.; R. F. Hertel, General Electric Co.; G. E. Hochstein, The Heil Co.; Dan E. Johnson, S. T. Johnson Co.; Milton Jordan, Timken Silent Automatic Div., Scaife Co.; W. F. Klockau, The Nu-Way Corp.; Robert Lucas, Toridheet Div., Cleveland Steel Products Co.; G. M. Marin, Sun-Ray Burner Mfg. Corp.; D. C. Patten, J. V. Patten Co.; J. Verne Resek, Cleaver-Brooks Co.; H. W. Shirey, Combustioneer Div., Steel Products Engineering Co.; P. M. Stephenson, Aldrich Co.; and Russell C. Westover, Jr., Ray Oil Burner Co.

Accessory Division—P. G. Crewe, Webster Electric Co.; Stanley Czarnecki, Eddington Metal Specialty Co.; Ralph L. Dennis, Oil Heat Supplies Div., Boston Machine Works; Robert Gray, Fuel Oil & Oil Heat; C. W. Lang,



CONVENTION COMMITTEE WELCOMES new member, Harry C. Gurney (second from left). Committee is represented by (l to r) George Hochstein, Dave Morgenthaler and Fred Weldon



ENGINEERING-TECHNICAL PANEL reviews presentation sequence. Panel members are: C. F. Suesserott, chairman (seated); (l to r), R. P. Gilmartin, W. A. Sullivan, D. H. Bottrill, K. T. Whitby and H. R. Heiple



NOT THIS! Many heating systems make you uncomfortable. It's too cold at the floor, just right in the middle of the room, too hot near the ceiling.



BUT THIS! Waterbury COMFORTROL By-Pass Heating gives CONSTANT comfort. Tests have shown less than one degree temperature variation from floor to ceiling.

New kind of heating gives home owners the constant comfort they want

The family at left complains. The family at right recommends its heating contractor to friends. Reason? The family at right has the constant comfort every home buyer expects.

To help you deliver constant comfort, Waterbury has developed COMFORTROL By-Pass Heating.

COMFORTROL works on a very efficient principle. It *mixes* cool air with warm air in a ratio that provides the exact temperature called for by indoor-outdoor thermostats. It supplies this warmth

continuously at the same rate it escapes through walls and windows. Waterbury COMFORTROL By-Pass Heating takes maximum advantage of perimeter heat distribution and zone controls. Easily adapted to summer cooling too.

Your customers get constant comfort in every room . . . a continuous supply of fresh, clean, humidified air . . . no hot and cold cycles or drafts. In tests, temperature varied less than one degree from floor to ceiling.

If you've ever needed an extra

feature to close a deal, you'll appreciate the talking points alone of Waterbury COMFORTROL.

SEND FOR FREE 32-PAGE BOOKLET!

"It Takes More Than Heat To Be Comfortable". It's packed with interesting information that will help you sell more units. Write Waterman-Waterbury Company, 1122 N.E. Jackson Street, Minneapolis 13, Minnesota.



Waterbury *Comfortrol*

By the makers of world-famous Waterbury furnaces and air conditioners

WITH THE ASSOCIATIONS

(Continued)

Hydraulic Div., Sundstrand Machine Tool Co.; E. N. McDonnell, McDonnell & Miller, Inc.; David T. Morganthaler, Delavan Mfg. Co.; J. W. Owens, The Mercoid Corp.; C. W. Potter, Field Control Div., H. D. Conkey & Co.; Dudley B. Robinson, Torrington Mfg. Co.; Frank P. Scully, Scully Signal Co.; Larry D. Sibley, Combustion Control Div., Electronics Corp. of America.

Technical Subjects Covered

Other subjects covered during the convention dealt with improving oil burner efficiency, classification of air filters and pulsation studies. In the technical session on improving overall oil burner efficiency, H. R. Heiple, Shell Oil Co., described the method used for measuring efficiency of oil burning equipment and how careful analysis of the data obtained showed overall efficiency of oil burning equipment varied with the firing rate and the length of each firing period. The longer the firing period, the higher the overall efficiency. A 1 gph oil burner operating 100 percent of the time gave an overall 65 percent efficiency at 9 percent CO₂. The same burner dropped to 40 percent efficiency when operating 15 percent of the time. The CO₂ remained at 9 percent.

Oil burner flame pulsations were discussed by David Locklin, Scaife Co. The studies, conducted at the Battelle Memorial Institute, covered a two year period. Field conditions were reproduced in the laboratory and results observed by the research teams indicate that definite pulsation patterns are the result of many variable conditions. One of the most noticeable causes of flame pulsation is the location of the oil burner. When placed near a basement wall, the pulsations are worse than when the burner is located in the center of the room. Another test showed that corner locations are less favorable than side wall locations. The data and patterns observed will make it possible for engineers to design equipment to overcome some causes of flame pulsation.

Filter Designs Reviewed

Air filters and their application were reviewed by K. T. Whitly, University of Minnesota, who described the dust particles found in the air in large city residential areas. Mr. Whitly said about 80 percent of dust volume consists of lint and filter design varies too much to rate one against the other properly. He pointed out that filters designed to trap smaller particles often become clogged with lint before they should because the size of the lint has not been taken into consideration. Dust filters designed primarily to trap lint particles often permit smaller particles to pass through the filter. He recommended that a filter be at least 2 in. thick to provide the best protection for residential applications.

A slide film entitled "Breakthrough for Profit" em-



FILM ON OIL BURNER nozzle performance is discussed by (l to r) Robert W. Hundley and T. R. Loizeaux, Sr.

phasized the value of office machinery in reducing overhead costs and keeping records up to date. One example showed how two office machines and two girls did the work normally performed by six girls without machines.

The 21st National Oil-Heat and Air Conditioning Exposition was held in conjunction with the 34th annual OHI convention. The convention sessions were held during the morning hours with the exposition open from 1 to 10 p.m. daily, June 11-15. There were 153 exhibitors of all types of heating equipment and accessories connected with oil burning equipment. The attendance was slightly over 12,000 for the five day period.

Present Awards for Service

At the annual luncheon session, awards were given to persons performing outstanding services to the association and the industry. The Aladdin Lamp award was presented to George Hochstein, Stanley Czarnecki, H. M. Spade and J. Verne Resek for meritorious service to the association.

Winning recognition for outstanding work in promoting the welfare of the industry, for which the Igniter Award is made, were P. L. Fentress, Jack Becker, Fred Griffin and James E. Dyer.

New Kalamazoo Code Discussed

THE KALAMAZOO SHEET METAL, ROOFING, Heating and Air Conditioning Contractors' Association held its June meeting recently. Main topic of discussion during the monthly meeting was the newly passed code which will go into action about August 1. The members discussed how the code will effect their operation, the ways and means of obtaining a license and its influence on the industry as a whole in Kalamazoo.

F. T. C.* Gains Recognition KLIXON *Thermo Snap*®

Temperature Control Applications Grow in House Heating Equipment

There are a number of reasons why so many designers incorporate KLIXON FTC Thermo-Snap Controls in their equipment — First, applications can be worked out in the laboratory for optimum performance; second, this performance is assured in the field because the unit can be shipped and installed as a package; third, there are no adjustments for people to tamper with in the field — malfunctioning caused by wrong adjustment is eliminated and service calls are reduced to a minimum; fourth, millions of KLIXON Thermo-Snap Controls are in daily use in thousands of different military and civilian applications, where they are known for dependable long life operation.

Here's what three manufacturers have to say about their experience with KLIXON Thermo-Snap Controls in heating equipment.



AUTOMATIC GAS EQUIPMENT CO.

Pittsburgh, Pa.

Manufacturers of Pittsburgh gas fired unit heaters.

MR. N. L. BLACKMORE, Sales Manager, has this to say —

"The small limit control, your C-4370, which we use is compact and takes up little space and does a very good job. We have been using KLIXON Controls for over fifteen years and have found them to be very durable and dependable."

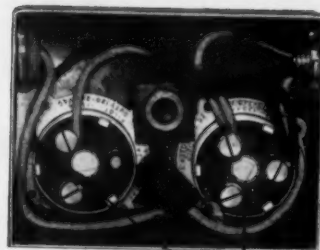
*FTC "Fixed Temperature Control" assures proper operation of the unit as designed by the manufacturer.

**METALS & CONTROLS CORPORATION
SPENCER THERMOSTAT DIVISION**

4007 Forest Street, Attleboro, Mass.

KLIXON

TRADE MARK REG. U. S. PAT. OFF.



YORK-SHIPLEY, INC.

York, Pa.

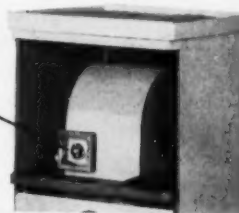
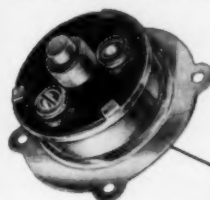
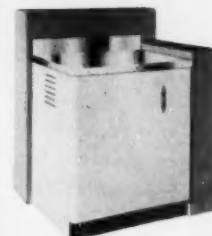
Manufacturers of York-Heat
oil-fired table top units.



MR. H. LEROY MOHN,
Project Engineer,
writes —

"We insist on
KLIXON Thermo-
Snap Thermostats in
our house heating
boilers because we

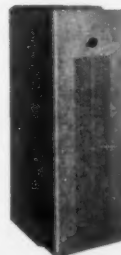
find they accurately control unit operation. KLIXON C-4370 thermostats are used to control the operation of burners and circulators to automatically govern the temperature of the home and domestic hot water."



MORRISON STEEL PRODUCTS, INC.

Buffalo, New York

Manufacturers of Mor-Sun furnaces.



MR. LOU HINE, JR.,
Chief Project Engineer,
says —

"We have used thousands of KLIXON Controls on our heating equipment for over ten years and have found these thermostats thoroughly dependable and they reduce problems to a practical minimum."

Thorough Coverage of Territory Urged At Sheet Metal Distributors' Convention

SUBJECTS RANGING FROM MORE thorough coverage of a territory to the increasing number of summer cooling sales were discussed during the National Association of Sheet Metal Distributors' spring meeting held recently in Pittsburgh.

Covering the territory was outlined by A. M. Roberson, C. M. McClung and Co., who pointed out his company's coverage of territory was improved by establishing heavy goods branches in other key cities in a territory; by training, educating and developing the best salesmen possible; by cutting down the large territories and eliminating overlapping territories and increasing work in the selling of speciality items among the branches. Mr. Roberson added, "We don't believe we are getting as thorough a coverage as is possible so long as we have one salesman who can afford to lose one customer without a struggle."

Training Needed for Cooling Boom

Pointing to the summer cooling boom, Henry E. Rosell, Jr., sales manager of Air Conditioning Div., American Radiator and Standard Sanitary Corp., said that no boom can continue without training of the dealers — training in application and training in selling. Mr. Rosell emphasized the importance of the dealer selling this item, which costs a great deal of money, to home-owners through aggressive sales promotion.

In his talk, "Who Manages Who?", Robert A. Gopel, American Aniline Products, Inc., blamed the sales manager for the poor performance of the salesman, claiming it is the sales manager's responsibility to select and train the salesman efficiently. Mr. Gopel outlined a plan the salesman should follow in making a sales presentation: First, he should gather all the information available on the prospect; and then he must arrange an approach which gains attention, develops interest, satisfies the needs of the prospect's business, points out customer benefits, offers visual proof of the product's performance, considers possible objections, has available logical answers to the objections, summarizes the presentation and finally secures action.

Functional Costing Described

The progress being made in functional costing was discussed by Thomas G. McGann, professor of market-

ing at Marquette University. Professor McGann drew an example in which a sheet metal contractor purchased a 20 ton shipment of steel at \$125 for a total cost of \$2500, but the cost of storing the steel in his shop through capital invested in the inventory and storage space lost increased the price an additional \$1097.50. The contractor could have purchased the same 20 ton lot from a warehouse, a ton at a time, for \$3300, thus saving \$297.50.

In discussing the "future" of steel, L. T. Willison, assistant general manager of sales, Jones and Laughlin Steel Corp., pointed to the steel production of 46 years ago and the tremendous gains that have been made. He said that in another 46 years — the year 2002 — steel production is predicted to reach around 310 million tons. Looking ahead to 1965, Mr. Willison said present estimates indicate a steel production figure of 160 million tons for the nation.

Economic 'Golden Age' Seen

The next 15 years were predicted as the "golden age" of economy by Robert M. Weidenhammer, professor of finance at the University of Pittsburgh. He sees greater demand in cars, homes and other commodities — a 50 percent greater demand — when the large number of children born since 1948 reach marriageable age and become buying factors in our economy. He also predicts that this increased economy will boost personal and corporate income to such an extent that the government will be able to cut taxes. But he also warned that the tax cuts should be timed so as to avoid inflationary booms which are followed by busts.

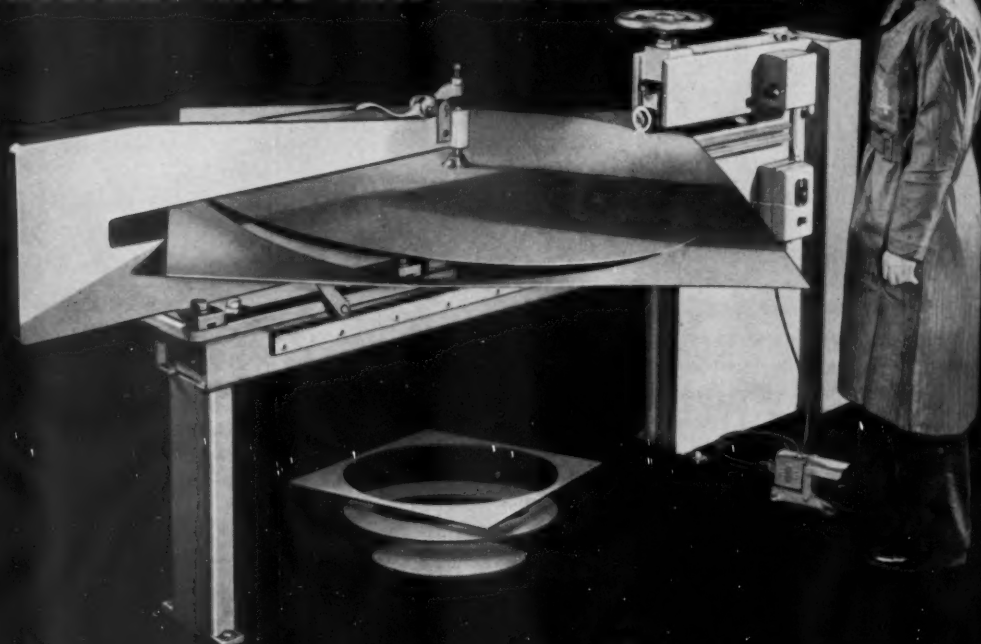
Members of the association attending the meeting were welcomed by President Roger K. Becker who described "this year as a year of problems." He pointed to the higher expenses, lower turnover, lower gross margin and lower profits facing the distributor.

"Consider for a moment the case of warm air heating and summer cooling," Mr. Becker said. "Most of us in this room can remember the time that we sold 22 in. and 24 in. furnaces. Six or seven items made a full wholesaler's stock. Now we are called upon to perform complex application and design engineering, carry over 100 items in stock . . . all this results in much higher cost."

Current activities, history of the association and im-

NEW!

NIAGARA RING AND CIRCLE SHEAR



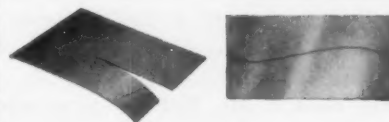
makes quick, easy work of cutting true circles

Here's a fast, versatile and profitable performer! Designed to provide the utmost in operating ease and cutting accuracy, this all-new Niagara Ring and Circle Shear No. 31-RC features a self-compensating circle arm which floats on guided ways to maintain true center automatically. Time-consuming adjustment for variations in thickness of material, overlap of cutters and diameter of circle is thereby eliminated.

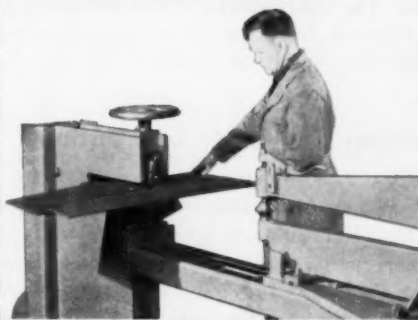
Set-up is simple: An adjusting crank and convenient scale enable quick positioning of the circle arm for cutting to various diameters. A quick-acting cam lever actuates the center clamp of the circle arm to hold varying thicknesses of material securely at all times.

Of sturdy, all-steel construction, this compact, modern machine is equipped with swing and slitting gages; high carbon, high chrome cutters; quiet operating, hobbed steel gears plus anti-friction thrust and bronze bushed bearings. With a capacity of 10-gage mild steel, it cuts both straight line work and irregular outlines as well as circles, circular holes and rings.

GET THE FULL STORY by writing for new, illustrated Bulletin 70 Supplement today, as well as literature on other Niagara Circle Shears, Ring and Circle Shears, Slitting Shears, Combination Shears and Flangers.



**CUTS STRAIGHT LINE WORK AND
IRREGULAR OUTLINES, TOO!**



NIAGARA

NIAGARA MACHINE & TOOL WORKS, BUFFALO 11, N. Y.

DISTRICT OFFICES: Buffalo • Cleveland • Detroit • New York • Philadelphia
Dealers in principal U. S. cities and major foreign countries

America's Most Complete Line of Presses, Shears, Press Brakes, Other Machines and Tools for Plate and Sheet Metal Work

WITH THE ASSOCIATIONS

portance of looking ahead and undertaking constructive action which will benefit the association in the future were discussed by Thomas A. Fernley, Jr., executive secretary of the association.

District Meet Set for Indiana

THE MIDYEAR DISTRICT MEETING of the Sheet Metal and Warm Air Heating Contractors' Association of Indiana has been scheduled for July 20 in Terre Haute at 6:30 p.m. The meeting will get under way with a dinner for members, their wives and guests. Wandering musicians will provide the entertainment.

After dinner a seminar on business management will be held. Subjects to be covered will deal with credit and collections, overhead problems, sales promotion and employee relations. President Don McCloskey will have charge of the program.

A new membership drive is scheduled to get under way at this meeting. The new drive will be featured by a monthly report in which racing cars will be used to represent the districts to show how they stand in the race. The contest will end officially with the convention which will be held early in February 1957 and at that time prizes will be awarded those crossing the finish line first.

Birmingham Discusses AGC Contract

THE NEW ASSOCIATED GENERAL Contractors contract and its effect on the members' company insurance program was discussed during a recent meeting of the Birmingham Chapter Roofers, Sheet Metal, Heating and Air Conditioning Association of Alabama. The discussion was led by Al Williams.

The key point of Mr. Williams' presentation was a warning to the sub-contractor who signs one of the new contracts which contain a "hold harmless" clause to make sure the coverage called for is thoroughly investigated. The sub-contractor's only alternative is to pass any increased cost in providing this insurance on to the general contractor or the customer.

Carolinas Hold State Convention

THE CAROLINAS ROOFING AND SHEET METAL Contractors and Suppliers Association held its 13th annual convention, June 21-24 at Myrtle Beach, S. C.

Taking part on the warm air heating and summer cooling forum were G. W. Denges, president of the National Warm Air Heating and Air Conditioning Association, and W. A. Kuechenberg, president of the Sheet Metal and Air Conditioning Contractors National Association, Inc. The two men were also featured speakers during the convention.



COMMEMORATIVE PLAQUE awarded the joint apprenticeship Committee of Kansas City is examined by members of the sheet metal contractors association. They are: (l to r) Norman H. Johnson, Tom Daly, H. H. Basore, Jr., George Battmer and Ralph Nicholas

Award Goes to Kansas City Association

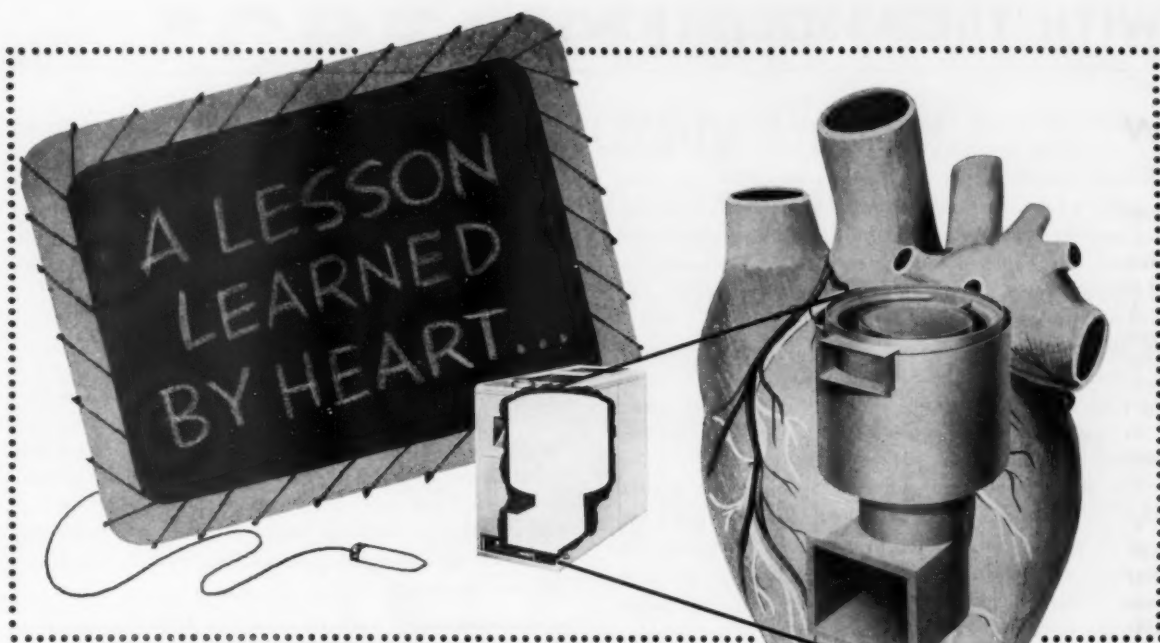
THE SHEET METAL and Air Conditioning Contractors' Association of Greater Kansas City was awarded first place in the annual contest among local apprenticeship committees. The award was made public at the Sheet Metal and Air Conditioning Contractors' National Association's annual convention held recently in Washington, D. C. H. H. Basore, Jr., president of the Kansas City association, made the formal announcement at the monthly meeting following the national convention.

The Kansas City association sent one of its members, Tom Daly, to New York City to attend a four-day conference on welfare and pension plans for employees. Mr. Daly will report his findings and how they can be adapted to the sheet metal and air conditioning industry at the next monthly meeting of the Kansas City association.

Other business discussed at the recent meeting included a report from the chairman of the apprenticeship training program who reported that the union representatives are cooperating in the effort to locate and select young men for the apprentice program who have backgrounds that will make them more adaptable to the learning of the skills required of a journeyman. A basic program is being used that will make it possible to determine a prospective apprentice's adaptability to this industry, thus reducing the number of drop-outs that are high in the first year.

Minneapolis Appoints 2 Committeemen

TWO NEW APPOINTMENTS have been made by the Minneapolis Sheet Metal and Roofing Employers Association. Harry Quade Jr., president of the association, has appointed George Sedgwick as a member of the welfare



Everyone who has ever had any experience with gas central heating units has thoroughly learned one thing (and some have learned it the hard way) —

The heart of any heating unit is the heat exchanger!

That's why the durability of the heat exchanger is the most important thing about any heating unit. And that's why Temco's exclusive new Ceramic-Clad* is big news in the heating field!

The heat exchangers in all Temco Lo-Boys, Hi-Boys, Gravity Furnaces, and Counter-Flo Furnaces are finished in Ceramic-Clad—a high-temperature porcelain enamel finish that is impervious to rust and will never burn out.

*Ceramic-Clad**

pioneered by Temco, is similar to the finish used for jet aircraft combustion chambers. It's capable of withstanding temperatures far higher than any furnace will ever reach. And it completely eliminates the danger of rust from condensation when the furnace is used in combination with air conditioning for summer cooling.

And in addition to Ceramic-Clad, Temco brings you other outstanding features such as exclusive Uni-Port Burner and silent operation.

*TRADE MARK REGISTRATION PENDING



*Turn to **TEMCO** for the best in gas central heating*



"THE COMPLETE LINE OF GAS HEATING EQUIPMENT"

ROOM HEATERS • FLOOR FURNACES • WALL HEATERS • UNIT HEATERS
WARM AIR FURNACES AND AIR CONDITIONING

Temco, Inc., Department B-908
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Please send me catalog and full information on
Temco Automatic Gas Warm Air Furnaces.

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Firm Name.....

Address.....

City.....Zone.....State.....

WITH THE ASSOCIATIONS

(Continued)

committee to replace Thomas Burniece Jr., a member of the committee for three years. Also, Mr. Quade named Howard Camitsch, the association's executive secretary, to replace Leonard Aanerud on the apprentice committee.

A summer cooling and warm air heating educational seminar, in which Dean Loren Miller, University of Michigan, gave tips on heating, summer cooling and ventilating, was held recently. A buffet lunch followed the meeting.

Certified adequate heating was discussed at a recent meeting. The program was thoroughly discussed, along with steps being taken toward forming a guide to achieve the program's objectives.

The three association members appointed as a committee to develop a guide, Fred Vogt, Ronald Blanks and Olaf Nelson, introduced the problem of determining the number of supply air openings necessary to heat different size rooms where the outside wall area varies with the volume of the room. This will require exacting specification in order to build the proposed guide around controversial points.

The Minneapolis Indoor Comfort Conference also was held recently, as Guy A. Voorhees led the discussions. Mr. Voorhees told dealers that to be successful the customer must be satisfied, the dealer must make profit.

Clinic Looks 'Ahead' at Cooling

WARNINGS OF THINGS TO LOOK for during the next 60 to 90 days of the summer cooling season highlighted the Institute of Heating and Air Conditioning Industries' first annual cooling clinic held recently in Los Angeles.

The problems of estimating were discussed by Homer C. Schmitt, Cooling Div. of International Sales Co., while the complexities of air balance and movement were outlined by Arthur Hess, Hess, Griener and Pollard Co.

The servicing and installation of summer cooling was covered by Cole G. Campbell, regional service supervisor of Carrier Corp., and the intricate subject of controls was handled by Harold McIntosh of General Controls Co.

Following each of the discussion periods, the speakers answered questions submitted from the floor.

New York Names Committees

COMMITTEE APPOINTMENTS have been made by the New York State Sheet Metal, Roofing and Air Conditioning Contractors' Association, Inc., according to President Irving G. Spalty.

Directing the apprentice training committee during 1956 will be Joseph R. Stiglemeier with Percy Sullivan and Charles Joyce, Jr. serving on the committee. Other

committees are budget, George Ballard, Sr., chairman, with Asaph B. Hall and Richard B. Millard; labor relations, Harry C. Gilbert, chairman, with Richard Machemer and Charles Schmitt; membership, George Ballard, Jr.; merchandisers cooperation, Monty Childs; safety, William Schmitt, Jr., chairman, with John Kirkpatrick co-chairman.

Air Circulation Described

THE GRANDS RAPIDS HEATING ASSOCIATION held its June dinner meeting recently with Clarence Grandstaff, chief applications engineer, C. A. Olson Mfg. Co., discussing "Continuous Air Circulation." Mr. Grandstaff outlined new techniques in the circulation of air using some of the data taken from the study his company conducted. This was the last meeting of the fiscal year for the Grand Rapids association.

Coming Events

July 19-22—Roofing and Sheet Metal Contractors' Association of Georgia, annual Convention. General Oglethorpe Hotel, Savannah, Ga. B. L. Noblitt, Executive Secretary, P. O. Box 1196, Augusta.

July 26—Chicago Warm Air Golf Association tournament. Itaska Country Club, Itaska, Ill. Mel Johnson, President.

Sept. 25—Chicago Warm Air Golf Association tournament. Ruth Lake Country Club, Hinsdale, Ill. Mel Johnson, President.

Nov. 26-27—National Warm Air Heating and Air Conditioning Association, committee meetings. Netherland Plaza Hotel, Cincinnati. George Boeddener, Managing Director, 640 Engineers Bldg., Cleveland 14.

Nov. 28-29—National Warm Air Heating and Air Conditioning Association, annual convention. Netherland Plaza Hotel, Cincinnati. George Boeddener, Managing Director, 640 Engineers Bldg., Cleveland 14.

Dec. 3-5—National Heating & Airconditioning Wholesalers, Inc., annual convention. Deshler-Hilton Hotel, Columbus, O. W. R. Bull, Executive Director, 1200 W. Fifth Ave., Columbus, O.

Feb. 25-Mar. 1—American Society of Heating and Air-Conditioning Engineers, annual convention and biennial exposition. International Amphitheater, Chicago. A. V. Hutchinson, Executive Secretary, 62 Worth St., New York 13.

"CRESTOGRIP"

The NEW Utility Plier

BY CRESCENT

**30% THINNER
TWICE AS STRONG
GRIPS LIKE A PIPE WRENCH**

CLEAN, SHARP
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NO PROJECTIONS

BOX JOINT ADJUSTABLE TO
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EXTRA THIN—ONLY ½"
AT THICKEST POINT

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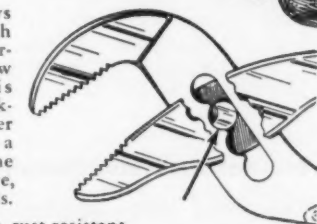
Crescent's No. P210 Utility Plier is completely new ... revolutionary! It's not a "slip-joint" plier and not to be confused with conventional lap-joint "pump" pliers. Its *double-strong* box joint design is absolutely unique and assures a powerful grip like that of a pipe wrench without side-ways twist or strain. It will grip flat, square, hex or round objects with powerful leverage.

QUICK, POSITIVE ADJUSTMENT

This cut-away view shows joint construction with its extra generous bearing surface at the arrow point. Adjustment is made by simply "walking" the rivet recess over the bearing point with a pumping action of the handles. Easy, positive, capable of heavy loads.

Handsomely finished in rust-resistant zinc plate. Overall length 9½ inches.

Sold by hardware dealers and industrial distributors everywhere.



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Crescent is our trade-mark, registered in the United States and abroad, for wrenches and other tools. Sold by leading distributors and retailers everywhere and made only by
CRESCENT TOOL COMPANY, JAMESTOWN, NEW YORK

WITH THE ASSOCIATIONS

ATTENTION ASSOCIATION executive secretaries and convention chairmen!

If you are planning to hold a convention in late February or early March it would be advisable to seek positive commitments from those planning to participate in the convention program. The American Society of Heating and Air-Conditioning Engineers will hold its biennial International Heating and Air Conditioning exposition in February rather than January and speakers for state convention programs might be difficult to obtain during this period because of their attendance at the exposition. The exposition will be held February 25 to March 1 to coincide with the Society's 63rd annual meeting.

Ways to Cut Service Costs Told

WAYS AND MEANS TO TURN A service department deficit into more profitable channels were discussed by T. A. Reed, market manager, Minneapolis-Honeywell Regulator Co., during the recent Wisconsin Oil Heat Institute.

Two steps were outlined by Mr. Reed whereby the servicing of an oil burner control system could be made more profitable. First, train the service man to analyze the control system carefully and spot the trouble quickly and efficiently, and second, instill the idea of selling in the service man's mind.

By spotting the trouble quickly, Mr. Reed added, the amount of time a service man spends on any one job can be reduced and hence less time and less money is involved which usually ends up as profit for the dealer. Often the service man, by using a little salesmanship on the customer, can sell the homeowner a delayed oil valve for his burner, or some other control which will eventually improve the system. This also means more revenue for the dealer resulting from a "money lost" service call.

The dealer can increase his profit, Mr. Reed said, with a good selling approach. He pointed to the clock-thermostat, emphasizing that the dealer should tell the customer the benefits he will receive from the thermostat rather than giving a "nuts and bolts" demonstration. The dealer might stress the night setback for lowering the indoor temperature in the evening for cool sleeping conditions. Or in the morning the automatic pickup to the day setting, which means the homeowner will wake up to a warm house. If the dealer fails to sell the clock-thermostat combination, he might obtain the homeowners' permission to install a mercury switch thermostat.

To augment his discussion, Mr. Reed used 50 colored slides showing a service man making an actual service call and then made a step by step check showing the service man's work and the selling procedure.

Florida Writes New Membership Rule

APPLICATION FOR MEMBERSHIP in the Roofing and Sheet Metal Contractors Association of Florida must be signed by two present members in good standing from the same area in which the applicant resides, it was decided during the Association's recent state convention.

Newly elected officers of the association are: John A. Diaz, Sr., president; Don Brown, first vice president; R. C. Tucker, second vice president; Victor Kinsey, third vice president; and R. J. Raymond, treasurer. Members of the board of directors are: H. C. Broom, Emory Donaldson, E. C. Goldman, Norman Sandell, Glenn McNabb, Henry Ford, W. L. Sims, Raymond Horst, Jack Strong, Joe Loudermilk, and Walter Anschuetz. Directors at large are Mack Fillingham, Charles Stephens, Vernon Blank, Wyley Shepard, George Ferber, Bill Palmer, Frank Ault, David Hess, John A. Gross, Steve Raymond, John Starr, Frank Tack and Howard Carpenter.

In another action the Board of Directors voted to attempt to raise \$1,000 by voluntary contribution to help finance the association's share of the Florida Building Council. Also, a resolution protesting the apprentice training program of the Florida Board of Education was adopted.

The convention agreed to form a chapter of the Sheet Metal Contractors' National Association in Florida which would remain separate from the state group.

Also discussed at the convention was the progress being made on adopting a local code, the history of the association, ways to prevent accidents, tips on taxes, ways to increase profit through advertising, the contractors' association with the architect on heating and cooling jobs and wage-hour laws.

Minnesota Holds Summer Meeting

THE SHEET METAL AND ROOFING Contractors' Association of Minnesota, Inc., held its summer meeting June 22-24 at Izaty's Lodge on Mille Lac Lake in northern Minnesota. Besides the full agenda of association business which was handled during the three-day meeting, the association members took part in the recreation facilities open to guests of the lodge.

Featured speaker was Philip C. Kosch, Bryant Div., Carrier Corp., who spoke on the opportunities in the heating and cooling industry and advised the dealers that a good sales promotion program would assure them a share of this business potential.



**AIRCOUSTAT SILENCES ALL FREQUENCIES
IN THE AUDIO-FREQUENCY RANGE!**

Resonators hold low-frequency sounds

Periodic internal structure dampens middle-frequency noise

Sound-absorbent materials suppress high frequencies

AIRCOUSTAT* Sound Traps eliminate air conditioning noise at 50% less cost

Acoustical Performance Guaranteed. Easy to Install. Pre-Engineered—No Design or Layout Headaches.

Revolutionary AIRCOUSTAT Sound Traps for low-velocity air conditioning systems reduce labor, materials and storage costs. Deliver guaranteed noise control efficiency.

You don't need special tools for installation. Since one 5-foot AIRCOUSTAT does the job of 80 feet of ordinary duct lining, you have less to install. Fitting AIRCOUSTAT units is easy since they fit any shape of duct . . . and are not dependent upon the size of the duct cross-section. Pre-engineering saves design and layout time because AIRCOUSTATS don't have to be individually designed for each particular

duct in the system. AIRCOUSTAT simplifies your storage problems and lets you get materials on the job early. In-shop lining of duct is eliminated—you can ship your ducts nested together and store them outside on the job site.

Discover how AIRCOUSTAT Sound Traps can save you time and money . . . create greater customer satisfaction.

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MAIL THIS COUPON TODAY

KOPPERS COMPANY, INC., Metal Products Div., Industrial Sound Control Dept., 6507 Scott St., Baltimore 3, Md. Gentlemen: Please send me a free copy of your booklet on AIRCOUSTAT Sound Traps.

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Westinghouse Proves

Look at These TEST RESULTS!

Here's proof that Westinghouse gives:

1. More Cooling per Dollar When You Sell
2. 23.4% More Cooling per Dollar in Use
3. 32% Extra Reserve Cooling Capacity

Laboratory tests made in April, 1956 against major competitive brands showed **Westinghouse excelled in all important respects.** Check the figures yourself!

Cooling Capacity

Westinghouse Air Conditioner.....	37,000 BTU/Hour
Brand A.....	34,300 BTU/Hour
Brand B.....	29,400 BTU/Hour
Brand C.....	26,700 BTU/Hour
Brand D.....	25,100 BTU/Hour

Operating Cost Ratio

Westinghouse.....	1.00
Brand A.....	1.02
Brand B.....	1.20
Brand C.....	1.22
Brand D.....	1.30

Look at this test of the Westinghouse compressor compared to a compressor used in nearly half of all air conditioners made:

Westinghouse Waterless Air Conditioner Compressor

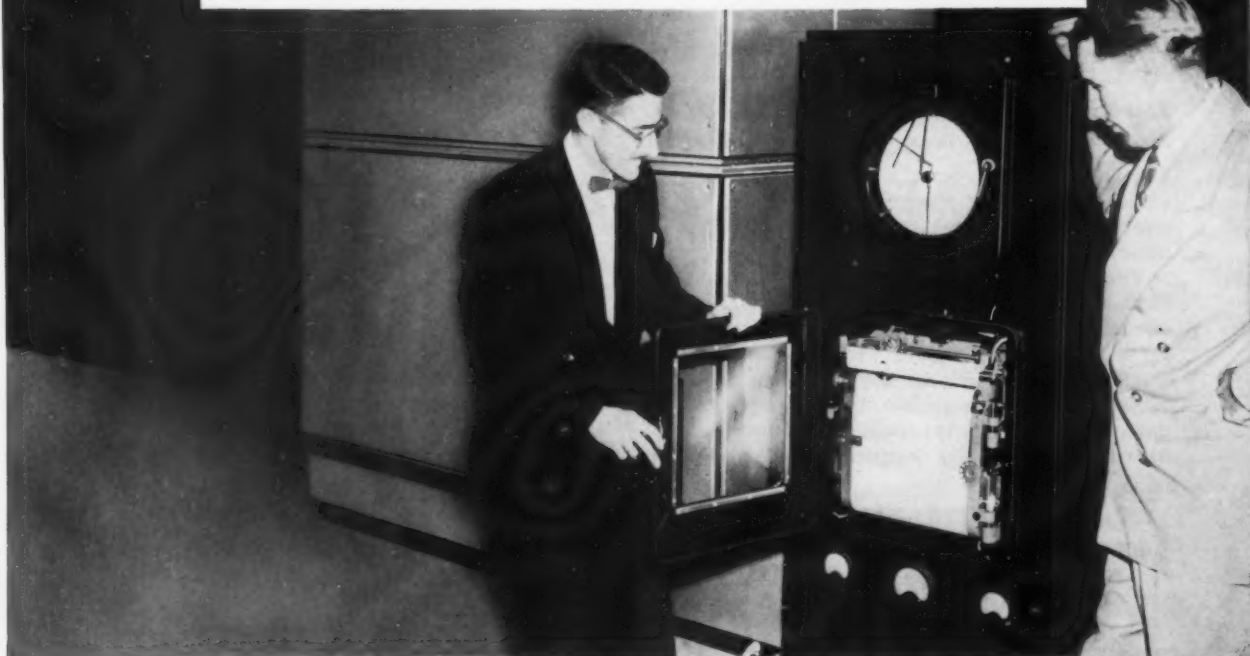
Capacity.....	41,300 BTU/Hour
Efficiency.....	11.5 BTU/Hour/Watt

Compressor Used on nearly half of all Air Conditioners made

Capacity.....	31,000 BTU/Hour
Efficiency.....	9.32 BTU/Hour/Watt

Test Conditions: Condensing Temperature.....	110°F.
Evaporating Temperature.....	40°F.
Suction Gas Temperature.....	65°F.

TEST CONCLUSIONS: Westinghouse has 32% more cooling capacity than nearly half of all air conditioners made. It costs 23.4% less per 1,000 BTU of cooling capacity delivered to operate the Westinghouse unit.



Your Customers Get 23.4% MORE COOLING PER DOLLAR

(SEE TEST FIGURES
AT LEFT)

**Just one of many reasons . . . Westinghouse Dealers
sell more units faster — with full profit!**

Here's proof! Recent laboratory controlled tests of major brands offer conclusive proof that Westinghouse units deliver up to 23.4% more cooling per dollar in use . . . as much as 32% extra reserve cooling capacity . . . excel in all important features. Check the figures yourself . . . see why it pays to be a Westinghouse Dealer!

Look! Here's proof, price, product, plus:

Westinghouse proves—with facts and figures that you get more cooling capacity, more efficiency unit-for-unit than with most other brands!

Westinghouse proves—you get full mark-up . . . at truly competitive prices!

Westinghouse proves—its flexibility with a unit for every air conditioning need and location!

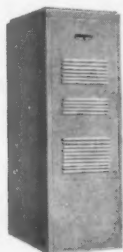
Westinghouse proves—with exclusive product advantages, national and local promotions, that you'll profit with Westinghouse!

PLUS — FREE LAS VEGAS HOLIDAY! Every Westinghouse Dealer and Distributor can cash-in on a fabulous six day, *all-expense-paid trip* to glamorous Las Vegas! **You can still share in Westinghouse profits, promotions and Las Vegas Holiday . . . call or wire your nearest Westinghouse Distributor today!**

INTRODUCING THE NEW WESTINGHOUSE GAS-OIL FURNACE LINE. Now a style and model for every residential heating need . . . they are designed to *link-up* with the Westinghouse "Extra-capacity" air conditioners for year-round air conditioning!



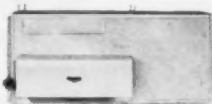
New Basement Units—gas or oil-fired units with automatic controls. Ideal wherever overhead space is limited.



New Utility Units—they're "File-Cabinet-Size" for homes without basements. Factory wired—gas or oil-fired.



New Counter-Flow Units—specially engineered units for perimeter type heating.



New Horizontal Units—need no floor space! Gas-fired, completely factory assembled with all controls and wiring.

PLUS—

a complete line of Air Conditioners:

Air-Cooled Units,
Water-Cooled Units,
Year-Round Units,
Heat Pumps—for
every residential and
commercial need!

WATCH WESTINGHOUSE!

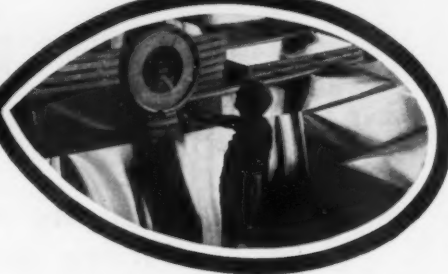
WHERE BIG THINGS ARE HAPPENING FOR YOU

WESTINGHOUSE ELECTRIC CORPORATION, AIR CONDITIONING DIVISION, STAUNTON, VIRGINIA

**call
Ryerson
for steel**



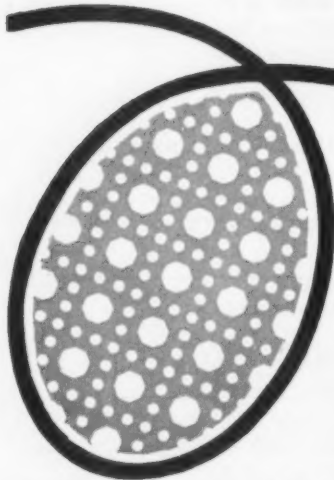
GALVANIZED SHEETS



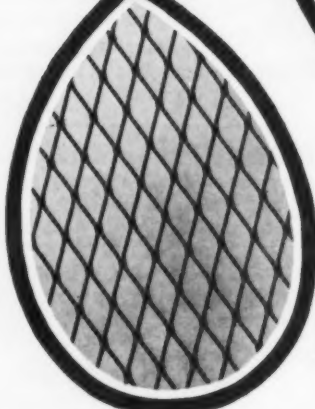
STAINLESS SHEETS



CARBON STEEL SHEETS



PERFORATED SHEETS



EXPANDED METAL

Quick delivery from the nation's largest sheet stocks

Need sheet steel in a hurry? Ryerson sheet stocks, always the nation's largest, have improved, substantially. (Galvanized is in particularly good supply.) So now you can get quick shipment of almost any type, gauge and size in almost any quantity—with just a call to your nearby Ryerson plant.

Do you want your steel prepared for immediate use? Ryerson facilities include the most modern, close-tolerance equipment for shearing to your order, in-

cluding cut-to-length lines that quickly convert coil stock to flat sheets of any measure.

A single order can cover all your needs—for bars, bands, angles, tubing, etc., black and galvanized, and more than 20 different kinds of sheet steel. Next time you need steel quickly, try this dependable service.

RYERSON STEEL

JOSEPH T. RYERSON & SON, INC. PLANTS AT: NEW YORK • BOSTON • WALLINGFORD, CONN. • PHILADELPHIA • CHARLOTTE, N. C. • CINCINNATI
CLEVELAND • DETROIT • PITTSBURGH • BUFFALO • CHICAGO • MILWAUKEE • ST. LOUIS • LOS ANGELES • SAN FRANCISCO • SPOKANE • SEATTLE



There IS Both "Rhyme and Reason" in AIR CONDITIONING DISTRIBUTION

(In Which We Try to Clear Up Some
of the Confusion Surrounding the Big
Residential Air Conditioning Market)

AIR CONDITIONING is a confusing term. It's confusing because it means different things to different people. It's also confusing because there are those who seem to want to make it so. For example, a recent piece in one of the trade papers says there's no rhyme nor reason to air conditioning distribution practices. Our purpose here is to clear up this confusion.

Cooling, Heating Can't Be Separated

Technically speaking, air conditioning can be defined quite clearly as at least the control of temperature, humidity and air motion in a building or home. Year 'round air conditioning thus includes heating, as you can't control inside temperature in the wintertime without heat.

But let's look at the subject from a different viewpoint. While technically incorrect, air conditioning often means, to the buying public, summer air conditioning only — with much if not all of the emphasis on cooling. However, even if this "public's-eye view" of air conditioning as being cooling were correct, heating is still inevitably involved.

This is so because the feasible and economical way to cool a house is with duct distribution of the conditioned air. Duct distribution of warm air is also, it happens, the best way to heat a house, as attested by the fact that some 80 percent of the one-family homes in the country are heated by warm air.

Houses are also heated, of course, by steam or hot water piped to various heat transfer surfaces located at strategic points (or to floor or ceiling panels.) At those points, the heat in the steam or in the water is transferred to the air in the room. The air thus is heated, and because it is heated, circulates to make the room warm (although the air is not filtered, humidified, or replaced with ventilation air).

You can't cool a house that way, though. For one reason, when heating, there's a difference in temperature between the hot water in the radiator and the air in the room of 70 degrees or more, and it is this

difference in temperature that creates the circulation of room air. To do a similar job in summer, you'd probably have to circulate liquid in the pipes at a temperature of somewhere between zero to, say, 15 degrees. Obviously, that's highly impractical from the cost standpoint alone. And there's another problem — even at a temperature much higher than that, 50 degrees or so, you'd get moisture condensed from the air on every cold surface.

That's why the trend of development in home cooling systems to be used in conjunction with so-called wet heating methods is along the lines of a cooling system separate from the heating system, with ducts for cooling or with room units of some kind equipped with fans for air circulation, a method of disposing of the moisture condensed from the room air, and an arrangement for replacing the room air with a proportion of ventilation air.

Warm Air Heating, Air Conditioning a "Team"

But with a warm air heating system, which uses ducts for the distribution of the heated air in winter — air that can also be humidified, filtered, and freshened — cooling and dehumidification can easily and economically be provided for summer air conditioning as well. The accessory cooling equipment need only be added to the warm air system, the same ductwork for the warm air distribution in winter being used for the cool air distribution in summer. Too, this accessory cooling equipment can be installed in the basement, utility room, or attic along with the furnace. It is thus not necessary to "tear the house apart" to install summer air conditioning, to mar the appearance of the living quarters, or to take up needed space in the rooms of the house.

That's why the central summer air conditioning or cooling system installed with or added to a warm air heating system is and will continue to be the most satisfactory and most economical method for year 'round air conditioning of homes. Warm air has been the overwhelmingly popular method of heating homes for many



years, and continues so today. As explained, it is easily and economically adaptable to the cooling of homes as well. Under these circumstances, its popularity continues to grow.

Depend on Duct Distribution

From the foregoing, it's obvious that both winter air conditioning (heating, etc.) and summer air conditioning (cooling, etc.) depend upon duct distribution of the air. Without the right ducts, properly designed, fabricated and installed, good performance won't be had either summer or winter. Many experts have said, time and time again, that "the duct design is the key to the success of the entire system."

Installation of the straight cooling components of the complete air conditioning system is simple. Too, it's becoming simpler every day, with factory-assembled cooling units, hermetically charged refrigeration units, simplified piping connections, and so on. While the factory-assembled cooling unit may represent a major part of the equipment cost of a complete installation, it's a minor part of the work in putting in the complete job. (This point is well-illustrated by a recent summer air conditioning installation in a medium-sized office — it took over three weeks to install the ductwork, but less than three days to deliver and hook up the factory-assembled compressor, coil and fan unit.)

What dealer-contractor has the design know-how, the fabricating skills and facilities, and the trained mechanics to lay out, fabricate and install this essential, important ductwork? Obviously, it's not the plumber. Certainly, it's not the commercial refrigeration man. Clearly, it isn't the electrician.

It is — and has to be — the warm air heating-residential air conditioning-sheet metal dealer-contractor. His entire business (not only home air conditioning) depends upon his knowledge of air distribution and his skills in and facilities for working with sheet metal and ducts.

Why would such a dealer-contractor, with all the know-how required for all other phases of the home cooling job, be content just to do the ductwork, on a subcon-

tract basis, for someone else? In the early stages of the boom in home central air conditioning, this practice has been employed in some cases by other types of outlets who can't do their own sheet metal work. It is not a satisfactory scheme, and as the residential air conditioning volume grows, it becomes less and less satisfactory.

As mentioned, the design and installation of the air distribution system is the key to the success of the entire installation, and it represents the major part of the job in the home. It is in no way an incidental part of the system, like an electrical connection or any plumbing connections that may be required. Too, the air distribution system is the part of the complete installation least susceptible to factory design and factory pre-assembly, thus requiring the most know-how and skill on the part of the installing dealer-contractor.

We've talked to a number of organizations on both sides of the fence — those who have tried to subcontract the sheet metal work for home air conditioning, and those who have done such subcontract work. Invariably — they've told us — the method doesn't work well.

From the standpoint of the man who must subcontract the sheet metal work, there are two basic reasons why it doesn't. First, this part of the complete job is too important to leave to an outside organization not concerned with or involved in the contact with the customer and the sale and performance of the whole job. Second, according to reports given us, the cost of the sheet metal tends to run too high.

From the sheet metal man's point of view, he realizes he is easily capable of selling and installing the entire job and sees no reason to confine his work to the duct system only.

It is for reasons such as these, as home air conditioning develops, that it becomes increasingly evident that the dealer-contractor must be able to handle the all-important air distribution system. Because of the close relationship between warm air heating and home cooling, he must be able to handle heating also. Thus, he has to be a warm air heating-residential air conditioning-sheet metal dealer-contractor.

Warm Air Dealer Has the Sales Contacts

Looking at the home air conditioning market from the sales side, what type of dealer is it who knows — or who will know, as the jobs come up — the prospects for home cooling? Again, it's obviously not the plumbing and wet heat contractor, responsible for the heating of but a fraction of the homes in the U.S. — and a fraction comprised of those homes least adaptable to summer cooling.

Again, it is obviously not the commercial refrigeration dealer, selling food display cases, ice cream cabinets and other refrigeration equipment to super-markets, grocery stores and drive-ins — not to home-owners and home-builders.

Again, it is — and has to be — the warm air heating-sheet metal dealer-contractor who makes his living day in and day out by selling and installing warm air heating systems and the necessary ductwork, and summer air conditioning, to his regular customers — home-owners and home-builders.

Others Want On the Band-Wagon

Home air conditioning is a big market today and will be a tremendously bigger market tomorrow. Naturally, many have wanted to climb on the air conditioning bandwagon. This attempt on the part of various groups to get aboard has been reflected by various changes — for expediency only, it appears — both in the content and in the titles of publications serving different fields.

For example, some of the plumbing magazines — realizing that home air conditioning is inevitably tied to warm air heating — have urged their readers to buy some tin-snips (as if that were all it took!) and “get into warm air heating.” Commercial refrigeration magazines have run articles on heating, and have practically exhorted their readers to get out of the refrigerator business and into the furnace business. Changes in the titles of magazines have been made to get the magic words “Air Conditioning” tacked on.

All this has caused — and is causing — needless confusion to both old and new manufacturers vitally interested in the home air conditioning market.

Reflecting its own readers' interests and activities, American Artisan is proud to note that it is not one of these johnny-come-lately's in the field of residential air conditioning. Its readers — the warm air heating-residential air conditioning-sheet metal dealer-contractors — have been selling and installing home air conditioning since the early 1930's. Too, American Artisan has continuously carried on its front cover since 1932, as a sub-title to its 93-year old name, the words “Residential Air Conditioning.” Neither we, nor our readers, have had to do any flip-flops now that the home air conditioning market bids fair to be a boom one.

Perhaps the close relationship between air conditioning and heating, and the slim relationship between air conditioning and commercial refrigeration, is dramatically illustrated by the almost simultaneous actions of the leading engineering societies in these two fields a few months ago. Both the American Society of Refrigerating Engineers, and the (then) American Society of Heating and Ventilating Engineers submitted to the votes of their respective memberships proposals that they add the words “Air Conditioning” to their names. It's significant that the proposal created so little interest on the part of the refrigerating engineers that hardly enough votes to count were received — and the name of course wasn't changed. On the other hand, the heating and ventilating engineers, closely concerned with air conditioning for over half a century, voted by an overwhelming majority to modernize the name of their society — which was done. Proof, it is clear, of the close and inevitable relationship of air conditioning to heating rather than to refrigeration, insofar as the memberships of the two leading engineering societies in these fields are concerned.

Careful checks in some two dozen areas have borne this point out — it is the warm air heating man who is now selling and installing the great majority of home air conditioning systems. Surveys by American Artisan — and by others, too — have shown this to be the case.

Problems Face Other Types of Dealers

In an expanding business like the warm air heating and home air conditioning market, new dealer-contractors



tors will appear and will take the places they win competitively. The important thing to remember is that because of the close and inevitable relationship between air conditioning and heating, and the great importance of the air distribution facilities to success of their installations, these dealer-contractors are going to have to be warm air heating and air conditioning dealers.

Even if we take the most optimistic predictions for the size of the home air conditioning market 10 years from now, it is impossible to conclude that there will be enough volume to support a dealer doing only home cooling, when the competition from those now in this work and well-qualified to sell and install air conditioning is considered. Perhaps there are exceptions to this statement in a very few parts of the U.S., where summer cooling may be of greatly increased importance compared to winter heating — though even such exceptions appear doubtful.

It can thus be logically and safely concluded that in the future, as at present, the big home air conditioning market will — as it is now — be inherently linked with the warm air heating market. And that both the equipment for heating (winter air conditioning) and cooling (summer air conditioning) will be sold and installed by the type of dealer-contractor who has the know-how, the facilities, the contacts with prospects, the business skills, and the working relationships with sheet metal workers to handle the jobs.

This is the warm air heating-residential air conditioning - sheet metal dealer-contractor. As amply proved by experience to date, in this early phase of the home air conditioning boom, any one else desiring to become a successful factor in this market must become a dealer-contractor of this type. And he will have to do so in the face of the competition from the well-qualified dealer-contractors already in this business, who are expanding their air conditioning activities every day. It has already been noted in such diverse parts of the country as Texas, Florida, and Indiana that contractors other than the warm air heating dealer are tending to give up the home air conditioning market to concentrate exclusively on commercial air conditioning.

This brings up another point.

Air Conditioning Is Two Distinct Markets

Further confusion about air conditioning results from the fact that air conditioning is not one thing or one field. While many — perhaps most — air conditioning manufacturers serve the entire air conditioning market, not all of them do by any means. It is essential that both these classes of manufacturers realize that air conditioning is definitely divided into two distinct and major markets:

- 1) The industrial-commercial market.
- 2) The residential market.

These two major markets are different in type and size of equipment used, as well as in the factors responsible for sales and installation of equipment. The channels of distribution from the manufacturer to the sale and installation of his equipment for ultimate use are totally different for each of these markets.

We're talking here, however, only about the residential air conditioning market — No. 2 as listed above. But here again there is further confusion because there are different types of air conditioning equipment for this application.

To some people, air conditioning means only the self-contained room or window unit, needing only an electrical connection to be put into operation. The installation of this form of air conditioning has little if anything in common with the central home system, and the sales problems with these two types of air conditioning are largely, if not almost totally, different.

In our attempt here to clarify some of the confusion surrounding air conditioning, we have emphasized the central home system. This is the currently "hot" application for which a tremendous future is predicted, based on its active present. It's also the air conditioning application which causes the most confusion in thinking on current and future market potentials, channels of sales and distribution, current practices and future trends and developments.

A "Jack-of-All-Trades" Dealer?

One other point should be mentioned. It has been suggested, on occasion, that perhaps a contractor-dealer

organization handling all types of heating — both warm air and wet heat — and air conditioning for all kinds of buildings will develop as a major factor in the national market. For many of the reasons given above, by observation of present trends, and by checks in many cities where complete records of heating (and, in some cases, air conditioning) installations are available, this would appear to be quite unlikely.

There are, of course, warm air dealer-contractors in some towns licensed to install boilers, and there are wet heat contractors licensed to install furnaces. When actual checks of the installations are made, however — as American Artisan has done regularly in many areas — it is found that each of these two types of dealer-contractors sticks pretty close to his own knitting. As a general rule, even though he may be licensed to install a furnace job, the wet heat contractor gets practically all of his volume with his boiler jobs, and accounts for very little of the total warm air jobs in his area. The same goes, in reverse, for the warm air man who may be licensed to do a wet heat job.

This is not surprising, and is most logical. These two types of home heating are quite competitive; the know-how, skills and facilities for making the two different types of installations are different; and the mechanics who do the work are different. In the case of union labor, the mechanics belong to totally different unions, and were trained to have — and must have — totally different installation skills.

The increasing development of the home cooling market in no way changes the picture, except perhaps in one instance. Because of the close relationship existing between warm air heating and home cooling — as has been discussed above — those contractor-dealers licensed or equipped to do both warm air and wet heating will undoubtedly find themselves doing more and more residential warm air heating work, and less and less residential wet heat work.

Speculation about the possible future development of an "all-around" warm air heating, wet heat, and air conditioning contractor involves also the types of buildings he would serve — everything from a one story home to a skyscraper, some would have us believe. A develop-

ment of any extent along these lines is highly improbable.

The reasons have already been indicated. For one thing, as has been explained, there are two distinct and definitely different air conditioning markets — the industrial-commercial, and the residential. To repeat, they are different in type and size of equipment used, the sales and installation problems are different, the required facilities are different, the labor skills are different, and the channels of distribution from manufacturer to ultimate user are different.

The differences in these two major air conditioning markets show up most strikingly, perhaps, in the dealer and contractor organizations that handle the actual installation work. The sales methods of the two groups, their business problems, their facilities, their technical skills, their labor relationships — even the associations to which they belong — are so different that this view of the total air conditioning market as actually two separate and distinct markets is very clearly substantiated.

There is, of course, some overlapping of the two markets on the smaller commercial air conditioning jobs. However, if any trend can be detected, it points to the continued and further separation of these two distinct air conditioning markets, rather than to any integration of them. As has already been noted, with both these air conditioning markets developing so rapidly, contractors other than the warm air heating type of dealer are tending to give up the home air conditioning market to concentrate on the commercial jobs.

* * * * *

Thus, we see that there is both rhyme and reason to the air conditioning distribution picture if we look at it carefully, and if we differentiate between the two major and distinct air conditioning markets.

Both of these separate air conditioning markets are well-organized and well-staffed with skilled and competent contractor and contractor-dealer organizations who have done, are doing, and will continue to do outstanding jobs of sales and installation. While the home air conditioning distribution picture may at times be confused by what must be called the wishful thinking of those desiring to climb on the air conditioning bandwagon, there is no need for it to be so.

Appealing Sign



CUSTOMER ATTENTION is gained through this attractively designed display sign and shop. The building is painted light green and trimmed in a light yellow

Engineering Skill



KEEPING CUSTOMERS SOLD is the result of the engineering skill that goes into each job. Partners Walter A. Babiarz (left) and John Jay talk over an installation

Growing Business, Customer Confidence

THERE ARE MANY ways a warm air heating dealer can develop confidence in his ability to select and install equipment to serve those who buy from him. The method used by Babiarz and Co., New York Mills, N. Y., is the recognition and application of up-to-date engineering practices as recommended by leaders in the warm air heating industry. The company is operated and owned by Walter A. Babiarz and John Jay, partners who have spent their entire business careers in the sheet metal and warm air heating industry. They started their apprenticeship at the same time and in the same shop about 20

years ago. The points of view shared by these two men have resulted in a steady growth in business since the company was formed in 1938.

In 1948, when perimeter heating was discussed by many dealers but installed by few, the Babiarz company learned all they could about this method of air distribution. After evaluating available data they decided to try the system in a home where the floor plan adapted itself to use of a perimeter system. The results were watched carefully and records of air temperatures in various parts of the house were kept throughout the first winter. The

Passersby are attracted by distinctive displays; others are reached through phone book ads. From there on, the company's reputation as a pioneer in perimeter heating clinches sales for prospering business

results so pleased the home owner and the Babiarz company that perimeter heating was decided upon for a 40 house project being considered.

Versatility Sells Perimeter Systems

Data obtained from the first perimeter system indicated that certain variations in the air distribution plan could be made without affecting the overall results. This permitted versatility in layout, with the result that perimeter heating was specified for all 40 houses. Customers who moved into the project praised the heating system. This appreciation of the engineering and craftsmanship that went into specifying the heating equipment has made sales representatives of many of the home owners.

The skill that has gone into engineering of previous installations is developing constantly and is applied on every new job. The partners make it a point to discuss each house plan and to reach an agreement on what will serve the customer best. There is no compromise with quality. Walter Babiarz says, "We sometimes fail to include in our bid some item that at first wasn't considered as a requirement, but because of some specific structural feature we find it advantageous to include the part. We do this at no extra cost. Quality is our prerequisite."

Association Membership Pays Off

The company is an active member of the local heating association, belongs to the New York State Sheet Metal and Air Conditioning Contractors' Association and is a dealer-member of the National Warm Air Heating and Air Conditioning Association. All of the latter's recommendations are followed in laying out and specifying heating and air conditioning equipment. Association membership certificates are prominently displayed in the showroom. In sales talks with customers, the prestige attributed to active association members is emphasized. Together with the reputation for pioneering perimeter heating in the area and following the latest technical data available to the industry, the company has earned the title of modern heating engineers. This reputation is the plus factor that helps sell its services when presenta-



PERIMETER HEATING job is outlined by John Jay to a prospective customer

tions by other salesmen are being weighed.

The various advertising methods which will be best for keeping their name before the public have been evaluated by the partners. The most effective medium is a well designed sign painted on the front and side of the office and shop. The shop is located on a triangular section of land and points toward the main highway between Utica and Rome. The building is painted a light green and trimmed with light yellow, providing an attractive and conspicuous background for heralding the services offered by the company in effective locations on the two exposed sides.

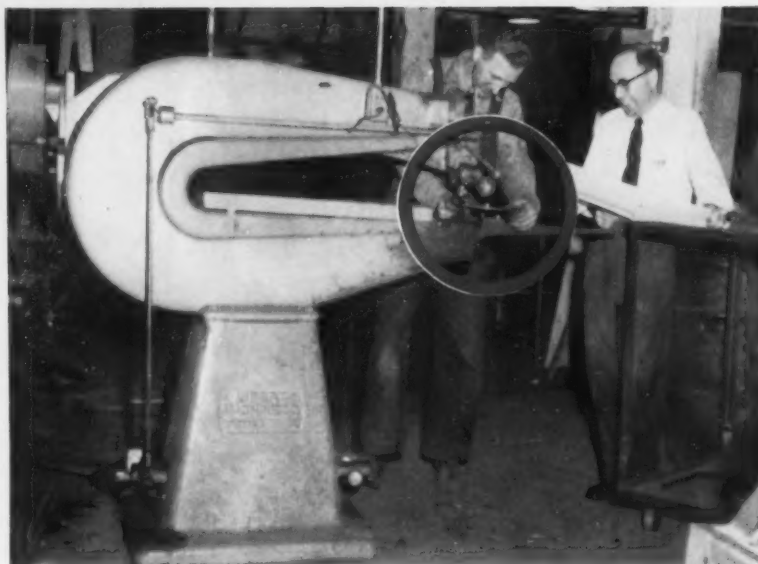
When customers come to the showroom, they are shown samples of the furnaces, diffusers, ducts and other components used in the perimeter systems, and they receive explanations of how the system works, where diffusers will be located and how each job is engineered to match the house, whether it is a new house to be built or an existing house requiring modernization. When a prospect leaves the showroom he carries away copies of literature provided by the manufacturer and a feeling that the kind of heating system he needs will be provided.

Phone Directory Pulls Leads

One other source from which quality leads have been obtained is the firm's large display advertisement in the telephone directory. Only one classification is used, that of heating contractors. There are 49 heating contractors listed in this classification, twelve of them using ads of various sizes. The Babiarz Co. ad is two columns wide, measuring $5 \times 4\frac{3}{4}$ in. and plays up the company's connection with a well known and highly respected furnace line. The illustration in the ad shows a furnace and an attached perimeter duct system with an exploded view of a diffuser located under a wide picture window. The written message is brief but points out the features of perimeter heating and reminds the reader that the company mechanics and engineers are specialists in this field.

The entire sales promotion program is designed to build prospect confidence in the reputation the company enjoys as a leader in the use of the latest technical information available to the industry.

NIBBLER IS USED on an exhaust system fitting cut from plastic sheet. Engineer Lester Fenlon (right) compares fitting to blue-print specifications



New Strides in Sheet Plastics

Open Ripe Market for Contractors

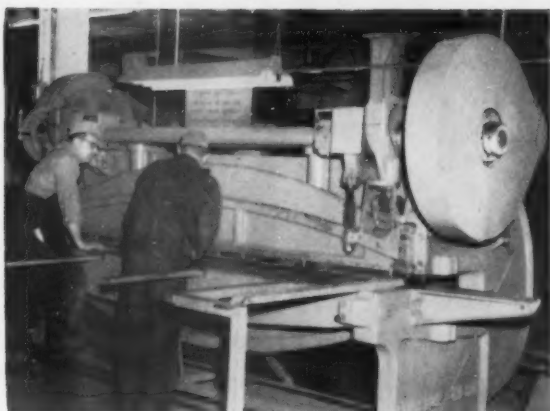
Developments which make plastics adaptable to established fabricating techniques give the sheet metal man an opportunity to take advantage of non-corrosive properties of sheet plastic for industrial venting, storage and other large scale applications



WELDING PLASTIC collar to a section of a plastic elbow is Edward Buss as A. T. Ihde, general manager, Alfred Goethel Sheet Metal Works, Inc., watches

SINCE WORLD WAR II the plastics industry has been growing rapidly due to the new processes uncovered. These new manufacturing developments have made the materials adaptable to many conditions which previously were not suitable to the use of plastics in certain types of work where something other than galvanized sheet metal was called for. Some of these applications were in industrial plants where the corrosion rate is excessive because of the nature of the manufacturing processes. The same techniques have been employed in fabricating plastic materials for use as ducts, pipes, tanks, hoods, and other essential parts of ventilating systems as are used for fabricating their counterparts from sheet metal. Shears and nibblers as well as presses, extruders and calenders play an important role in this work.

The sheet metal contractor has an important function in this growing field. One contractor who has been keeping up with the increasing demand for plastic ventilating



HEAVY DUTY EQUIPMENT like this power shear makes it possible to fabricate any sheet metal product required by industrial customers. Same equipment can be used for plastic materials



SPECIFICATIONS CALLED FOR two exhaust openings for positive internal pressure and sliding glass doors for visual observation of experimental operations taking place in this cabinet

systems is A. T. Ihde of the Alfred Goethel Sheet Metal Works, Inc., Milwaukee.

Corrosion-Resistance Is Feature

The plastic material used for corrosion-proof ventilation and exhaust systems is generally rigid polyvinyl chloride sheets. This material is known as a thermo-setting resin and is not deformed at elevated temperatures (150 F). Another plastic material frequently used for tank linings is polymethyl methacrylate which will also stand temperatures up to 150 F. A third plastic material that will stand temperatures up to 212 F and is applicable to tank lining is of phenolic, furane and polyester resin base with a glass fiber reinforced mat to give self-supporting characteristics.

Tanks fabricated from polyester materials are light in weight and more resistant to chromic acids and some other oxidizing solutions than phenolic or furane resins, but are less resistant to organic solvents.

Tanks fabricated from phenolic and furane resin materials usually are of sheet material fabricated from a mixture of liquid resin and asbestos, giving it the ability to resist corrosion common to organic solvents and corrosive salts as well as diluted sulfuric, hydrochloric and phosphoric acids.

Phenolic resins are attacked by caustic solutions, whereas furane resins are resistant to alkali in all concentrations.

Rigid polyvinyl chloride and polymethyl methacrylate resin materials have greater resistance to impact and corrosives than furane, phenolic and polyester resins.

Standard Tools Are Used

Ducts, fittings, hoods, tanks and other components of a plastic exhaust system can be prefabricated in the sheet

metal shop and assembled on the job in much the same way as sheet metal systems. In the Goethel company's shop there is a man trained in cutting and fabricating this material. He uses standard shears and other tools for shaping the various parts and a hot air welding gun for joining parts together.

Hot Air Welds Surfaces

The welding gun delivers hot air in a small jet against the two surfaces being welded. The air pressure at the welding gun will range up to 40 psi at temperatures up to 700 F (no open flame is used in the welding process). The welding rod is usually an extruded spline of the same material being joined.

Edges of the sections to be welded should be beveled at a 50 to 70 deg angle. The welding rod should be slightly larger than the groove formed by the parts to be joined. The temperature of the air discharged at the gun is governed by the kind of material to be welded; it must be hot enough to secure a strong weld, yet not too hot because excessive temperatures will decompose the plastic material.

Welds Are 80-90 Percent as Strong as Sheet

In the welding process the rod is held perpendicular to the groove, warmed by the air jet from the gun which is held at approximately an 80 deg angle to the groove. A slight brushing action is used to soften the surfaces on both sides of the groove. As the welding rod softens and flows into the groove the gun and rod are moved progressively forward to warm the two parts being joined. A properly formed plastic weld is expected to be from 80 to 90 percent as strong as an unwelded section of the same material.

Sections of plastic duct systems are joined together

by flanged joints. The flanges are welded to the sections in the shop fabrication process. Inserting plastic bolts and nuts and use of a softer material as a gasket completes the assembly on the job.

Plastic pipe and fittings resembling iron, steel, and copper components used for water systems are available for draining tanks, drums, and other containers for corrosive liquids. Pipe, fittings, and valves are connected by either flanging or screw threads. Recent improvements in valve construction make it possible to eliminate the once characteristic stem leakage problem.

Good Selling Job Required

According to Mr. Ihde, the opportunities for the sheet metal contractor in this field are limited only by the effectiveness of his sales approach. Architects, consulting engineers, and plant engineers are constantly seeking ways to beat the corrosion problem. The pricing arrangement is very favorable from the contracting point of view. One consideration that must be weighed in estimating is the labor cost involved in shop fabrication — it usually takes three to four times as long to fabricate a plastic fitting as it does a similar sheet metal fitting.

Fabrication of plastic duct systems is only a part of the overall operation of Alfred Goethel Co.

Among the services offered are industrial sheet metal work, dust collecting systems, industrial ventilation and air conditioning installations.

Most of the company's business comes from previous customers who are visited periodically by the department heads.

Estimates Based on Previous Jobs

Cost estimating for bid proposals is based on similar jobs done in the past. Each operation is described in a written report that becomes part of a permanent file. The actual cost is recorded and compared with the estimated costs. At the time a bid is being prepared, the records are checked and those operations that are similar to the proposed work are evaluated against current labor and material costs. The contract, when signed, specifies every part to be provided and tells what is to be done. Frequently it contains a section that specifies what will not be done. This clause in a contract is designed to make the contract clear at the time it is let. The company feels if everyone concerned knows what's expected of him, the job will be completed more quickly.

Contracts Are Clear-Cut

The management of the Alfred Goethel Co. wants it understood what is expected from the sheet metal contractor and what is expected from others. One case where a clause to this effect was used with satisfactory results to all parties was related to the removal of windows to allow bringing equipment into an existing building.

Another practice of the company is sending a personal



OPERATION OF a blast gate and ball joint for exhaust system — a specialty item manufactured by the Goethel company — is checked by general manager A. T. Ihde

letter as a form of proposal rather than a regular business form. Mr. Ihde feels that this personal touch is more influential in obtaining acceptance of the proposal and the work to be done.

Quality of workmanship is also an important factor used to obtain business. The company employs 35 sheet metal workers the year 'round; 90 percent of these men are journeymen, all specialists in industrial sheet metal work. The remainder are apprentices. One of the factors that Mr. Ihde believes contributes to the high quality work done by the company's employees is the fact that over 50 percent of the journeymen are graduates of the company's apprenticeship training program which stresses good workmanship and responsibility throughout the entire period of apprenticeship.

Review Customers' Specifications

If a customer has a special piece of equipment he wants fabricated to exact specifications, such as the glass doored cabinet in the illustration, the customer's specifications are reviewed and any improvements that will help reduce its cost or improve its performance are made prior to starting work on the order. The glass doored cabinet was to be used for an important experimental operation. An exact air flow must be maintained in every section of the cabinet at the same time. The Goethel company recommended installing two blowers in the top of the cabinet, thus dividing the cabinet volume into two theoretical zones with an even air flow through each.

To level out the work flow pattern, the company manufactures and sells to other sheet metal contractors, on a national basis, a complete line of blast gates and ball joint assemblies for exhaust systems.

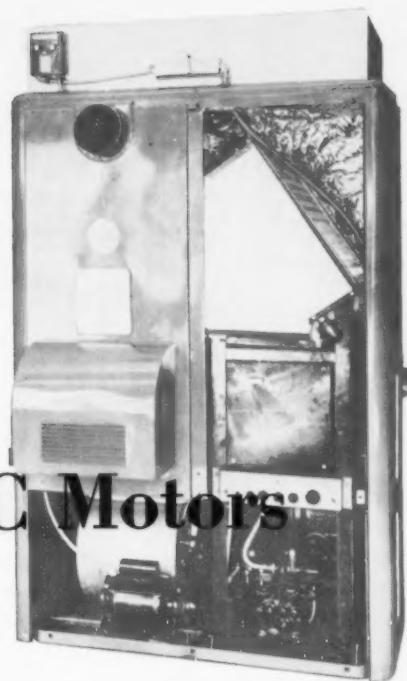
The shop is equipped with every type of heavy and light duty machinery for fabrication of any type of job, large or small.

Air Conditioning 'Doctor' Must Know

The Anatomy of A-C Motors

A review of the different kinds of electric motors and a rundown on the duties of each is called for as a vital phase in the air conditioning service picture

By T. N. Schierloh
Delco Products Div.,
General Motors Corp.



WHEN WE consider electric motors used in the summer cooling industry, one of the first things that becomes evident is the evolution of the motor from a comparatively large and simple mechanism with rather liberal mechanical, electrical and noise tolerances, to a complex group of specialized machines built to specifications of size, mechanical tolerances, and quiet, efficient performance unheard of only a few years ago.

We have watched the progress of the mechanical refrigeration unit used for cooling from a simple compressor, usually remotely mounted and easily accessible,

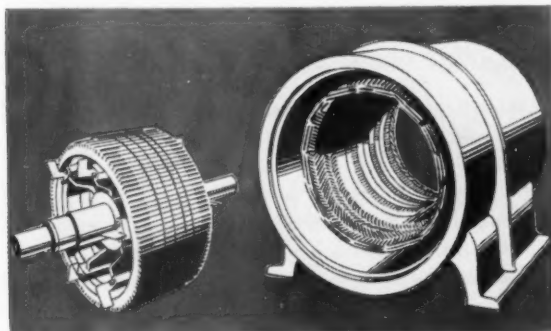
to a compact and complex air conditioning machine incorporating several types of specialized motors governed by intricate and sensitive control devices.

Serviceman Is 'Doctor' of Motors

In order to be qualified to approach any service problem properly, the serviceman must be trained just as a doctor must be trained. And, like the doctor's, his education will fall into four general categories:

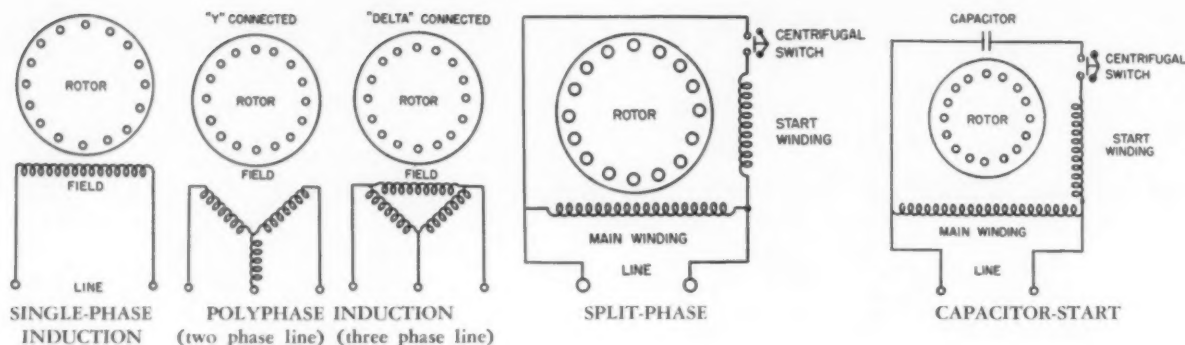
- 1) Anatomy and physiology (product knowledge).
- 2) Hygiene and health (protective maintenance).
- 3) Diagnosis (trouble shooting).
- 4) Therapy and surgery (adjustment and repair).

Let's consider the first category — motor anatomy and physiology. Here our studies will tell us how and why motors are made the way they are — what they are supposed to do and what their limitations are. This is what we call product knowledge. Without this basic prerequisite we are not qualified to proceed to the remaining three requirements of a good serviceman. Let us, therefore, briefly consider the anatomy fundamentals of some of the motors used in air conditioning equipment. The basic alternating current motor is the squirrel cage induction motor consisting of a stator with windings embedded in the slots of the laminated steel core, and a rotor with conductor bars and end rings in the



BASIC A-C MOTOR, the squirrel cage induction unit, consists of a stator with windings embedded in slots of laminated steel core, and a rotor with conductor bars and end rings in pattern of a squirrel cage

These are the basic motors encountered by the



pattern of a squirrel cage. The schematic circuit of a simple induction motor is shown in the illustrations for a single-phase motor and for a polyphase motor.

Single-Phase Motor Needs Starter

Unfortunately, a motor using single-phase current is like a one-cylinder steam engine on dead center. Such a motor can not start unless you give the shaft a twist. In practice, all such single-phase motors are designed with some special device to act as a starter.

Polyphase motors, on the other hand, are similar to a multi-cylinder engine and have the ability to start themselves. They are simple in construction and generally cause fewer troubles than other types of motors.

Since we are concerned mostly with single-phase motors, it is worthwhile to review the more important types and the method used for starting each type.

Review Types of Single-Phase Motors

The oldest type of single-phase motor is the split-phase. It is an induction motor with two distinct, distributed windings: one for starting and one for running conditions. The phase or starting winding, magnetically displaced from the main or running winding, is disconnected from the line when the motor reaches a predetermined speed. Disconnecting the start winding is accomplished by an internal, centrifugally operated switch or by an external thermal or magnetic relay.

Split-phase motors have the advantage of constant speed operation under varying load conditions. High breakdown torque with resultant overload capacity is also an important characteristic. Application of split-phase motors is limited, however, by the high starting current and relatively low starting torque.

The capacitor-start motor was developed to overcome the shortcomings of the split-phase motor. The running characteristics are the same, but a capacitor in series with the starting winding has the effect of lowering the

starting ampere requirements and increasing the starting torque.

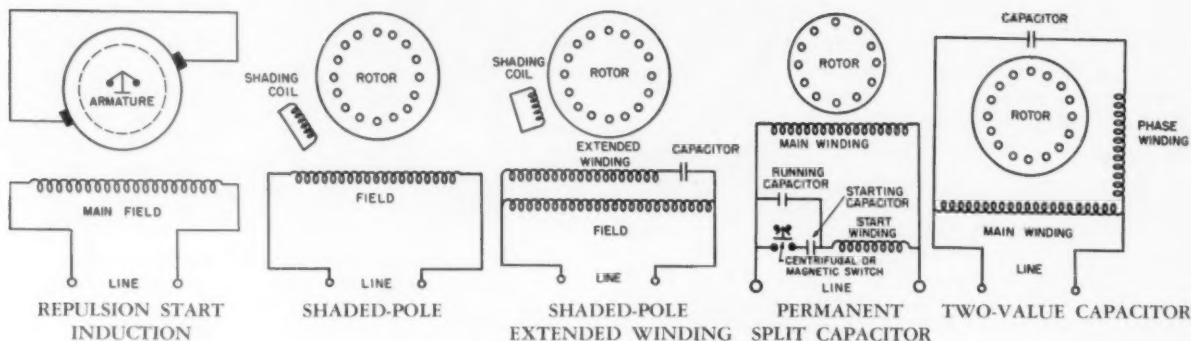
The repulsion-start induction motor is another approach to the high-starting-ampere, low-starting-torque problem. In this motor the start winding is eliminated and a wound armature is substituted for the squirrel cage rotor. In operation, when the stator field winding is energized by the line current, a magnetic field is produced which induces a current in the armature winding. The magnetic poles formed on the stator and armature have the same polarity causing a repulsion torque. After the motor reaches approximately 75 percent of full speed, the commutator bars of the armature are short circuited by means of a centrifugal device. The armature then acts like a squirrel cage rotor and the motor continues to rotate as an induction motor. The repulsion-start induction motor features high starting torque with the ability to handle long acceleration loads. It draws relatively low starting current and has the running features of the split-phase and capacitor-start motors. Among its disadvantages are inherent maintenance problems of a brush type motor, radio and TV interference, and higher rebuilding costs. The initial cost is also usually higher than other types of single-phase motors.

Shaded-Pole Motors Reflect New Ideas

Proceeding to some of the later designs of motors, the shaded-pole motor has played an important part in the industry.

Shaded-pole motors are single-phase motors having a short circuited auxiliary winding displaced magnetically from the main winding. The short circuited, or shading coil, causes the magnetic flux in a portion of the pole to lag behind the main flux, setting up a weak torque to start rotation. The shaded-pole motor uses a concentrated winding, salient-pole construction, with the shaded coil usually consisting of a one-turn, welded or soldered copper strap. Squirrel cage type rotors of either alumi-

air conditioning serviceman:



num die cast or welded copper bar construction are used.

The simplicity of construction and correspondingly low cost are prime advantages of shaded-pole motors. In addition they have no internal switch and contact assemblies, have moderate locked amps and can be economically adapted for multiple speed operation.

Use Is Limited

Performance-wise, shaded-pole motors are characterized by low starting torque, low efficiency, moderate power factor and relatively high running amperes. The higher operating temperatures caused by less efficiency usually require an air-over-motor application. The low starting torque limits their use largely to direct drive fan and blower applications where locked rotor torque requirements are not severe. Motor stability at low speeds is greatly affected by line voltage variations.

Extended winding shaded-pole motors are essentially a variation of the shaded-pole motor, with the exception that an additional or extended winding is added to the basic shaded-pole motor design. This extended winding is in series with a capacitor and the combination is in parallel with the main winding.

The extended winding motor has a power factor between 70 and 90 percent and the running current is 65 to 80 percent of that of a shaded-pole motor. Higher power factors are possible, but the capacitor cost materially increases in the higher range.

Other characteristics such as efficiency, starting torque, breakdown torque, etc., are the same as shaded-pole motors.

These motors are gaining increasing interest for applications such as room air conditioners where power factor must be increased and running current decreased from that required by shaded-pole motors.

Compared to permanent-split capacitor motors which will be considered next, the running current is greater for extended winding motors, but power factor can be comparable.

Cost of extended winding motors is greater than shaded-pole, but less than permanent-split capacitor motors.

Power Restrictions Give Rise to New Type

Capacitor motors using the same value of capacitance for both starting and running conditions are termed permanent-split capacitor motors. These motors are similar in construction to conventional single-phase motors, having separate main and phase distributed-type windings. The phase winding, in series with the running capacitor, remains in the circuit at all times, eliminating the need to disconnect the phase winding during motor operation. The capacitor is usually oil filled and may be mounted on the motor or at a remote location from the motor.

The outstanding advantages of permanent-split capacitor motors are their high power factor and low running current. Power factors can range from 80 to 95 percent and running currents are approximately 35 to 65 percent of the currents drawn by shaded-pole and split-phase motors of the same horsepower and rating. Generally permanent-split capacitor motors operate at higher speeds than shaded-pole motors; however, permanent-split capacitor motors can be designed for high slips at full load conditions. Multi-speed operation of permanent-split capacitor motors is possible by the use of a tapped winding or external choke.

The low starting torque of permanent-split capacitor motors limits their use to direct driven fans and blowers. The correspondingly low locked amperes, however, are often an important advantage. Even though permanent-split capacitor efficiencies are higher than those of shaded-pole motors, most permanent-split capacitor motors are also rated as air-over-motor. The primary disadvantage of permanent-split capacitor motors for ventilating purposes is their higher cost, due to more expensive windings, and the running capacitor.

Permanent-split capacitor motors are especially appli-

cable where current and power factor restrictions limit the use of other motor types.

The capacitor-start, capacitor-run, or two-value capacitor motor is rapidly replacing the repulsion-start induction motor on 1 to 10 hp single-phase applications. In addition to the electrolytic starting capacitor which is disconnected at switching speed, this motor has a smaller capacity, oil filled capacitor which, in series with the phase winding, is always in the circuit. The function of the smaller capacitor is to provide quiet and efficient operation and improve the running power factor.

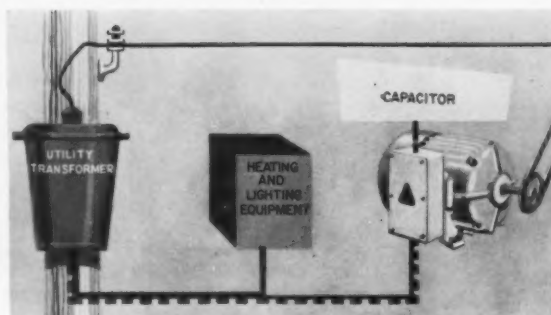
What's Impact of Power Factor?

The term 'power factor' has become more and more important in recent years and a review of electric motors would not be complete without considering its impact on the motors of the future.

Motor power factor is determined by the fact that induction motors draw not only power current, but also a magnetizing current component from the power lines. The power portion of the current is consumed in the motor to drive the load; the magnetizing current is used only to produce the magnetic fields that are necessary for operation of the motor. Thus, the magnetizing current does no work; however it does put an additional load on the power lines.

Power Load Reaches Critical Stage

With the increasing number of new installations of major appliances and central air conditioning systems especially in residential areas, the loading of existing power lines (or any practical sized distribution system) has reached the critical stage.



POWER FACTOR is becoming more important to air conditioning dealers. Power current is solid line, magnetizing current is dotted line. Note that incandescent lamps and resistance loads use no magnetizing current

The only practical way to reduce the line current is to reduce the magnetizing current component by the use of capacitors which have the ability to produce magnetizing current. In certain areas, especially the large cities in the south, the power companies have invested millions of dollars in capacitor banks for power factor correction in residential areas. This will not be nearly enough, however, to handle anticipated requirements; some of the correction must be made at the point of use. Future single-phase air conditioning equipment will not be approved unless the overall power factor is within specified limits. The trend, therefore, is to more capacitor motors of all types.

Next month we shall move into another phase of training for air conditioning servicemen — preventive maintenance of electric motors — and take up the remaining fields of know-how for the air conditioning "doctor": hygiene and health, diagnosis, therapy and surgery.

Horsepower Ratings Called Misleading

HORSEPOWER RATINGS, used for some time by the manufacturers of room cooling equipment, fail to give an accurate measure of the cooling capacity of air cooled central cooling systems, stated Bruce D. Henderson, Westinghouse Electric Corp., Air Conditioning Div., at a distributors' and dealers' meeting in New York.

"Comprehensive tests in our laboratories revealed that some units carry published performance figures almost 50 percent higher than they are capable of producing," Mr. Henderson said. "This is a direct result of the common industry habit of using the terms 'compressor horsepower' and 'ton of cooling capacity'

interchangeably. In air cooled units nothing could be farther from the truth. A homeowner attempting to select one of five major air cooled home summer air conditioners, each claimed far and wide to be a 3 hp model, would find the actual cooling capacities ranged from 25,000 Btuh to 37,000 Btuh — a variation of a full ton in cooling capacity."

"For example," Mr. Henderson said, "a water cooled unit can operate at 120 psig condensing pressure and produce 36,000 Btuh. When this is converted to an air cooled unit and the condensing pressure is increased to 200 psig, the air conditioner will no longer produce

36,000 Btuh, but may drop to as low as 25,000 Btuh. To compensate for this in capacity, the compressor size must be increased."

Mr. Henderson urged the industry to establish and enforce the proper rating of cooling units. A certification system similar to that used by the American Gas Association should be worked out.

"Horsepower," Mr. Henderson concluded, "is a term used to measure the amount of power required to drive the compressor of a cooling unit. Ton of cooling capacity is an accurate measure of the amount of heat that can be removed in a specific period of time."



COORDINATING EACH STEP from signing contract to startup is job of (l to r) George Marth, inventory control; Allen M. Morrison, engineer; Walter Marth, general manager

CROSS-CHECKING the perpetual inventory ledgers is responsibility of George Marth, office manager

Cost Control System Boosts Dealer's Profits



By meeting operating cost problems one at a time and developing such labor-saving devices as detailed blueprints, inventory cross-check and distinctive proposal form, this firm builds profits on a reputation for efficiency and dependability in heating-cooling work

A CONSTANT BATTLE faced by every warm air heating-cooling dealer is one of keeping operating costs down and sales volume up. Many dealers have worked out their own formulas for solving this problem. Walter Marth, general manager, G. F. Marth and Son, Milwaukee, has found a solution to many of his problems by working on the contributing problems one at a time.

To keep his operating costs down he has worked out an order handling system for the sheet metal shop which helps to produce duct system components for an installation at a minimum of cost to the customer.

Blueprint Shows Each Part

A shop order for fittings and duct work begins when a detailed blueprint is given to the shop foreman. Each section of ductwork and the accompanying fittings are shown. Where special fittings are needed, a detailed blow-up is prepared by the engineer who surveyed the building at the time the contract was signed. Often a building's

structural features limit the choice of fittings which can be used.

The engineer making the survey recognizes the requirements of the job and by giving a complete description of the fitting required, makes it possible for the sheet metal shop to prefabricate the fitting needed to match the connecting sections of duct work.

When special fittings and combination fitting-equipment sections are needed, the shop follows instructions given by the engineer. When the part has been completed, the engineer is asked to check the assembly to verify that it is as he specified. Prefabrication of equipment sections in the shop makes it possible to produce the part more economically than if it had been fitted on the job or if the journeyman had to leave the job temporarily to build the part in the shop.

By specifying each part needed and prefabricating it in the shop, it is possible to complete the job, once the assembly is started, in a businesslike manner, giving confidence to the customer as well as a minimum of incon-



SHOP PREFABRICATION OF special assemblies is checked carefully by company engineer before being sent out to the job



EVERY PART for a job is checked against the detailed shop drawing before the installation crew leaves the shop, resulting in a minimum of lost time

venience on jobs where customers are already living on the premises.

To speed the completion of every job, a full crew is assigned to the job at the time it is started. The Marth company employs, in addition to 16 sheet metal workers, two refrigeration mechanics who double as heating equipment mechanics and are responsible for installation and servicing of cooling and heating equipment.

The office has its responsibility of keeping costs at a minimum and sales volume at a steady level. To maintain low operating costs, George Marth, office manager, has set up a perpetual inventory system which keeps an adequate supply of shop fabricated fittings, furnaces, cooling units and other basic equipment on hand. The inventory system is based around a $3\frac{1}{2} \times 5$ in. card for each piece of major equipment as well as for each type of fitting on hand. The card shows the number of a certain item in stock on a given day, the date and number for each withdrawal, and the date and number when new stock is added.

Inventory Is Double-Checked

The perpetual inventory card is supplemented by a set of ledgers which shows where each piece of inventoried stock was used, and there is a cross check to indicate that the inventory card has been altered to show the withdrawal from stock. The inventory check is connected to the usual bookkeeping system to show when new stock has been ordered and when it has been received. This information also is recorded on the inventory card and checked in the ledger column.

The inventory system is an essential asset to the sales program, Walter Marth believes. He feels that it's embarrassing to complete a sale and then find the order must be held up until equipment can be obtained from the factory. He finds an adequate inventory is most important during peak seasons, for both heating and cooling equipment. The inventory follow-through plan has been responsible for a review of the perpetual inventory about three months ahead of the peak season demand and orders are placed to assure adequate stock during the busiest months. To insure adequate stocking of the most popular models and sizes, past experience is drawn upon when

placing an order for building the inventory level.

Another advantage of the perpetual inventory is that the company is able to reduce its inventory to the lowest level possible at tax time. This is quite important in Wisconsin where a state law makes an assessment against all property in stock on May 1.

Green Form Draws Attention

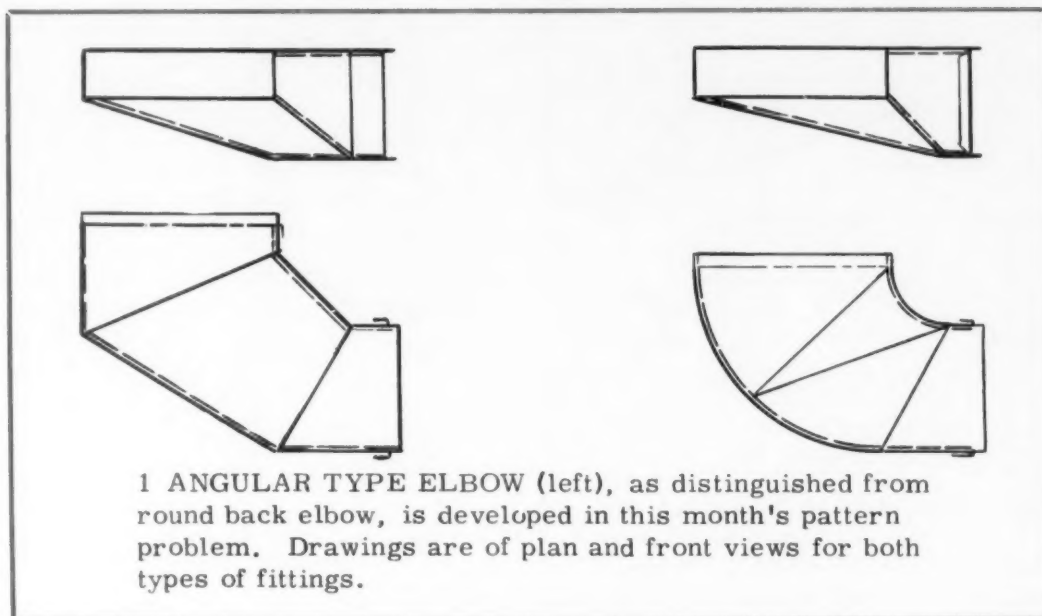
To help influence a prospect who has requested proposals and prices from several heating and air conditioning dealers, Walter Marth has designed a quotation form printed on green paper for his method of calling attention to what his company has proposed. He believes a colored form will stand out from other correspondence on a man's desk or among bids and literature received by a home owner. Frequently, when talking with a prospect on the phone, he mentions his proposal and says, "It's the green one." This comment helps to point out the proposal and to develop conversation along the points of most interest to the prospect.

The company's sales promotion program is designed around periodic advertising in the local newspaper. The sales appeal emphasizes the company's long history of service to the community (the company was formed by Walter Marth's father, G. F. Marth, in 1910). The ads frequently quote comments made by customers and describe the quality work done for the customer, the theme being that the company has given satisfactory service to other customers, and the same can be expected by all who place their orders with the company.

Another source of leads has come from a series of ads placed in conjunction with the Milwaukee Sheet Metal Contractors' Association's Operation WHAM. WHAM (Warm air Heating and Air conditioning Modernization) is a sales promotion program recommended by the National Warm Air Heating and Air Conditioning Association.

It is Walter Marth's opinion that his business continues to grow because of the care put into each phase of his operation. Each function is coordinated to be in tune with another so the company may retain its reputation of considering the customer's problem ahead of its own, with the result that each customer is a satisfied customer.

HUGH REID'S SHEET METAL PATTERN



1 ANGULAR TYPE ELBOW (left), as distinguished from round back elbow, is developed in this month's pattern problem. Drawings are of plan and front views for both types of fittings.

Here Are Steps for Laying Out An

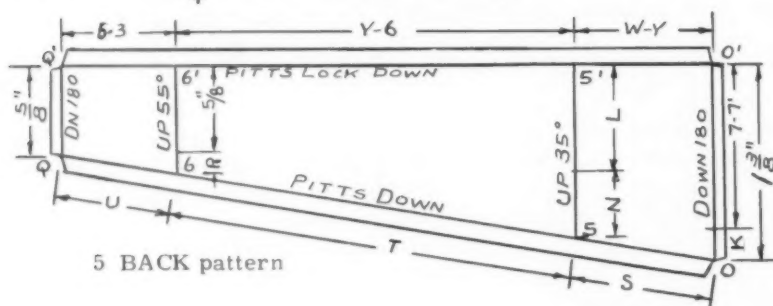
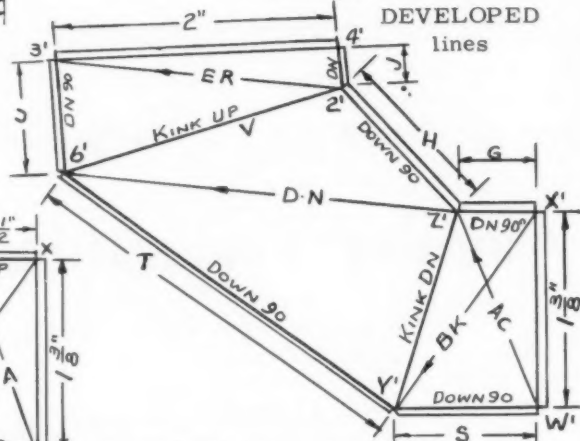
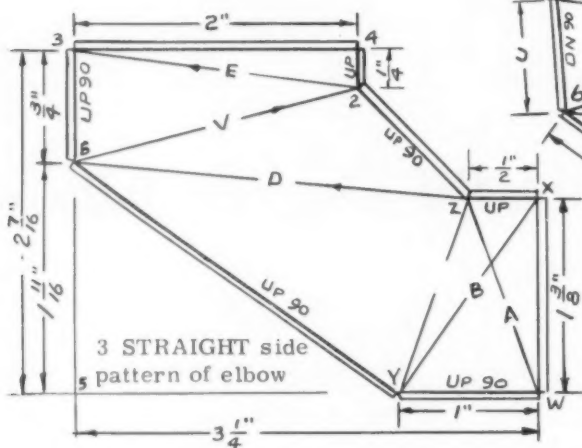
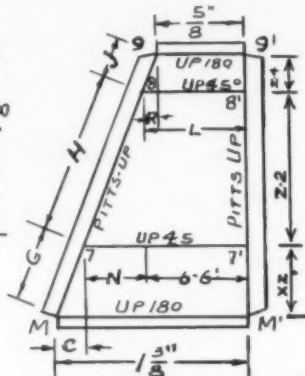
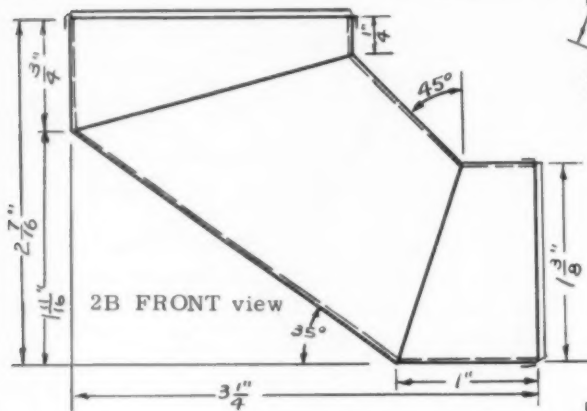
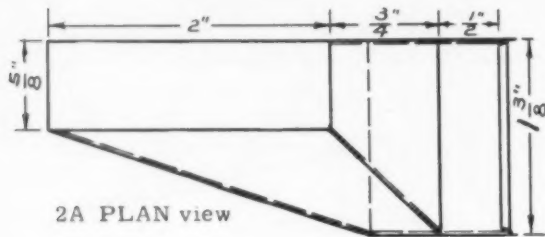
Angular Transition 90 Degree Elbow

Producing a straight line for the offset side in both back and throat patterns permits use of a Pittsburgh lock forming machine and saves fabrication cost

A LETTER FROM a midwestern sheet metal contractor requests a layout for an angular transition 90 deg elbow. He feels that if the back and throat patterns could be developed to produce a straight line for the offset side in both patterns, the shop man would be able to use a Pittsburgh lock forming machine with a resultant reduction in fabrication costs. Fig. 1 presents front views of both the angular and round back elbow. A pattern is developed for the angular type in this month's pattern problem.

To meet the given requirements of the pattern problem

as outlined, the following procedure must be followed. First, the straight side pattern would be developed; this would be a duplication of the front view drawing (Fig. 1) with the required allowances for seams and joints added and the work lines drawn. The length of the straight side of the back and throat patterns could then be determined from the front pattern and the bend lines located. The true length lines for the offset side pattern would be developed from the work lines on the front pattern and the rise or fall distances as shown on the back and throat patterns.



The following is a step by step analysis of the pattern problem solution:

To Lay Out the Straight Side Pattern, Fig. 3 —

a) Draw a horizontal line and on this line establish point W. From point W measure to the left the given lengths 1 in. and mark point Y. From point Y measure to the left $2\frac{1}{4}$ in. and mark point 5.

b) From point 5 draw a line perpendicular to W5. Measure up this line the given length $1\frac{11}{16}$ in. (Fig. 2B) and mark point 6. Draw the line 6Y. From point 6 measure up $\frac{3}{4}$ in. and mark point 3.

c) Draw a line from point 3 perpendicular and to the right of line 3-6. Measure 2 in. to the right of point 3 and mark point 4. From point 4 draw a line downward, perpendicular to line 3-4. Measure down $\frac{1}{4}$ in. and mark point 2.

d) From point W draw a line perpendicular to line W 5. Measure up this line the given length $1\frac{3}{8}$ in. (Fig. 2B); mark the point X.

e) From point X draw a line to the left and perpendicular to line WX. Measure $\frac{1}{2}$ in. from point X and mark the point Z. Draw the line 2Z. Draw work lines A, B, D, V, E.

To Lay Out the Throat Pattern, Fig. 4 —

a) Draw the $1\frac{3}{8}$ in. horizontal line MM'. From M' draw a line perpendicular to line MM'. From the straight side pattern (Fig. 3) transfer lengths XZ, Z2 and 2-4 to the vertical line (Fig. 4) and mark the points 7', 8', 9'. Through the points draw lines perpendicular to line M'9'.

b) From point 9' measure to the left the given length $\frac{5}{8}$ in. as shown on the plan view (Fig. 1) and mark the point 9. Draw the line 9M.

c) From points 7' and 8' draw perpendicular lines to the left to intersect with line 9M. Mark these intersecting points 7 and 8.

To Lay Out the Back Pattern, Fig. 5 —

a) Draw the $1\frac{3}{8}$ in. vertical line OO'. From point O' draw a line perpendicular to line OO'.

b) Working from the straight side pattern (Fig. 3) transfer lengths WY, Y6, 6-3 to the horizontal line (Fig. 5) and mark the points 5', 6', Q'. Through the points draw lines perpendicular to line O'Q'.

c) From point Q' measure down the given length $\frac{5}{8}$ in. (Fig. 2A) and mark the point Q. Draw the line QO.

d) From points 6' and 5' draw perpendicular lines to intersect line QO. Mark these intersecting points 6 and 5.

The Offset Side Pattern, Fig. 6 —

a) Draw the vertical line W'X', which is $1\frac{3}{8}$. Establish points W' and X'.

b) Draw a right angle. From Fig. 3 transfer line A to the vertical line. Using a compass measure the line 7-7' (Fig. 4) and subtract this from line M'M (Fig. 4). The difference, marked C, is transferred to the horizontal leg of the right angle, and the hypotenuse line AC is the developed line. With point W' (Fig. 6) as center, and radius AC, draw an arc to the left of point X'. Set a compass at distance G (Fig. 4) and with point X' (Fig. 6) as center, cut the arc AC and mark the point Z'.

c) From Fig. 3, transfer line B to the vertical leg of a right angle and fall distance K (Fig. 5) to the horizontal leg. The hypotenuse BK is the developed line. With point X' (Fig. 6) as center and radius BK, draw an arc to the left of point W'. With line length S (Fig. 5) as radius and point W' (Fig. 6) as center cut the arc BK and mark the point Y'.

d) Transfer line D from Fig. 3 to the vertical leg of a right angle, and the difference between line 7-7' (Fig. 4) and line 6-6' (Fig. 5), marked N, to the horizontal leg. The hypotenuse line DN is the developed line. With line length DN as radius, and point Z' (Fig. 6) as center, draw an arc to the left and above point Y'. With line length T (Fig. 5) as radius, and point Y' (Fig. 6) as center, cut the arc DN, and mark the point 6'.

e) From Fig. 3, measure line V with a compass, and with point 6' (Fig. 6) as center, draw an arc to the right and above point Z'. Measure line H (Fig. 4) and with point Z' (Fig. 6) as center, cut the arc V and mark the point 2'.

f) Line E is transferred from Fig. 3 to the vertical leg of a right angle and fall distance R from Fig. 5 to the horizontal leg. The hypotenuse ER is the developed line. With point 2' (Fig. 6) as center and radius ER, draw an arc above point 6'. With distance U (Fig. 5) as radius, and point 6' (Fig. 6) as center, cut the arc ER and mark the point 3'.

g) Set a compass at given line length 2 in. (Fig. 3), and with point 3' (Fig. 6) as center, draw an arc to the right and above point 2'. With line length J (Fig. 4) as radius, and point 2' (Fig. 6) as center, cut the 2 in. arc drawn from point 3', and mark the point 4'.

Through the developed points draw the pattern outline. Add allowances for seams and joints and mark the patterns for fabrication.

On the fire for next month's Artisan:

► How variety pays off in heating and cooling promotion

► Some recommendations for preventive maintenance of air conditioning motors

► A summary of proposed efficiency standards for warm air heating systems

► Another practical pattern problem solution for sheet metal fittings



AIR CONDITIONING HANDBOOK

How to Solve Engineering
and Installation Problems

What to Do About

Short Cycling of Compressor Motor

When the common complaint of frequent on-off cycles arises, here's what to look for in the thermostat, pressure cutouts and motor overload switch, together with a rundown on the probable causes of malfunctions which could cause serious trouble

By S. W. Reid

**Air Conditioning Engineer
Gilbert Associates, Inc.**

ONE OF THE symptoms of trouble in the operation of a cooling unit is the complaint that the unit starts and stops too often. Known technically as short cycling, this type of operation should always be investigated by the dealer before any serious breakdown occurs.

The heat removing ability of any cooling unit is not constant in the sense that one thinks of the light producing ability of an electric light bulb. However, under normal operating conditions, the capacity does not range more than perhaps 10 percent and for our purpose might be

thought of as being constant.

In comfort cooling in a residence, the cooling unit's capacity is matched to a heat gain value calculated, in most cases, at assumed average maximum conditions. This value gives us only a glimpse of the cooling load, which, being influenced by many variables, is highly complex and constantly changing. Normally it is not necessary to have an exact picture of the cooling load, for if its average or economical maximum can be fairly accurately predicted and matched with cooling capacity, it can be safely assumed that there will be sufficient capacity for all other less severe conditions. In residential practice, it is to be expected that there may be short periods when the

load will be higher than the economical maximum used for equipment selection.

In simple terms the problem of residential cooling is to maintain a constant temperature in a space which is receiving heat at an ever changing rate with a machine that removes heat at a substantially constant rate.

The problem is comparable to one calling for maintaining a constant water level in a tank with a fixed capacity pump when the rate at which the makeup water enters the tank varies widely.

In the example with water, it would be good practice (assuming that the level were not too critical) to select a pump that could remove

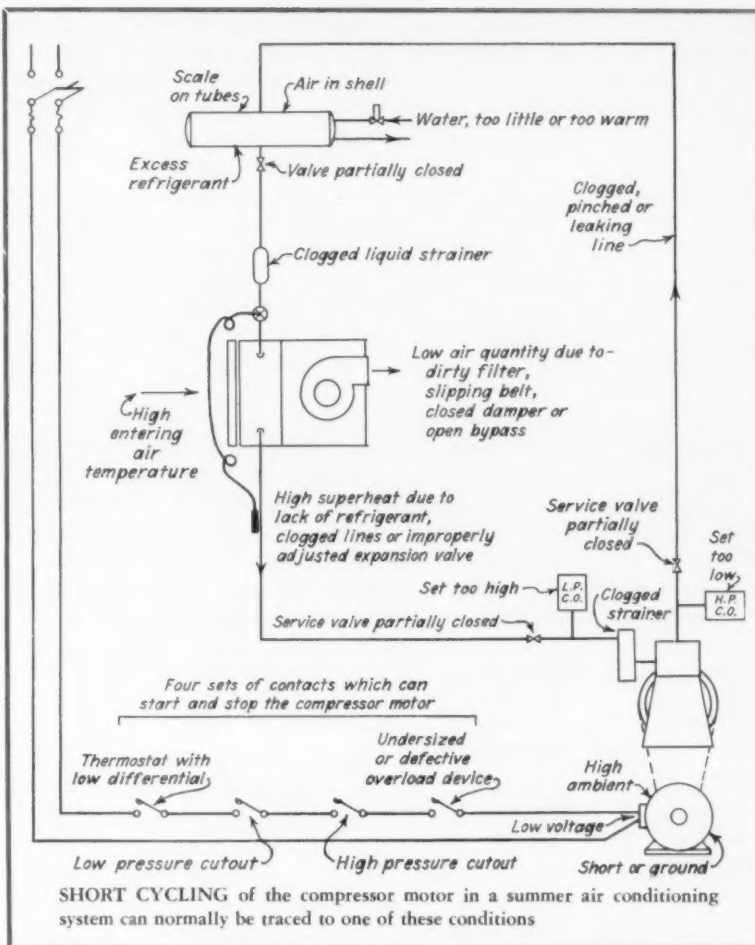
water at a rate which matched the average maximum makeup rate, expecting that occasionally for short periods the makeup rate might exceed the pump capacity and cause a temporary rise in the water level. Most of the time, when the makeup rate was less than the pump capacity, the water level could be maintained by turning the pump off when the water dropped a little below the desired level and turning it on again when the water rose a little above. Thus, at any one instant, the water level might not be exactly as desired, but over a period of time the average level would be correct. If the pump "on" and "off" levels were kept close enough together, the slight variation might be hardly noticeable.

The application of cooling unit to cooling load is exactly analogous to the application of the pump described above. Instead of maintaining a water level, we maintain a temperature level. If we were operating the unit manually, we could watch a thermometer, turning the unit on whenever the mercury rises a little above the desired level and off whenever it drops a little below. On-off control is known as cycling. It is a very common method of control for air conditioning systems and is accomplished automatically with a thermostat.

Cycles Depend on Load

Under the cycling method of control, there is no fixed time limit to either the "on" or the "off" parts of the cycle. However, we would expect to find long "on" and short "off" periods during the greatest load and the opposite when the load is light. Each type of operation is perfectly normal provided it relates to the load condition as stated.

Let us consider the abnormal condition known as short cycling. This, like normal cycling, cannot be precisely defined in terms of time. It must be related to overall operation, since its detection is largely a matter for a trained observer who knows what to expect under various influencing factors. As a matter of general definition, however, short cy-



cling is simply operation where there are far more "on" and "off" periods in a given time than would normally be considered necessary.

The typical self-contained air conditioner is furnished with a thermostat, a low pressure cutout (switch), a high pressure cutout (switch) and an electrical overload device. Each has a set of electrical contacts which are in series either with the compressor motor or with the holding coil in the compressor starter. Opening and closing any one set can stop and start the compressor in a manner that could be defined as short cycling.

Of the four devices that could stop and start the compressor, the thermostat is the only one which under normal conditions is intended to do so. Contacts in the other three devices are supposed to remain closed except when abnormal conditions

prevail. This discussion will point out certain circumstances under which each of the four devices may cause compressor short cycling.

Keep Differential Low

The difference between the "on" and the "off" temperatures is known as the thermostat differential. Obviously, for comfort purposes it is desirable to keep the differential as low as possible. On the other hand, from the standpoint of compressor operation, the larger the differential, the less frequent need be the starts and stops. A differential of about 3 F (on some thermostats the differential may be adjusted) has been found satisfactory. If through use or abuse the thermostat differential decreases appreciably, the thermostat may be a factor in short cycling. The switching action of such a thermostat

would be very sensitive to temperature changes. The cooling unit would have to run only a short time to produce a slight change downward and would have to be out of service only a short time to allow a slight upward change. Sensing these changes, the thermostat would operate the unit correspondingly.

Related to the thermostat with a narrow differential as a factor in short cycling is the oversized unit. If the unit capacity were far greater

than the load, it could reduce the space temperature quite rapidly even when controlled by a thermostat with a normal 3 deg differential. The "on" time could be quite short, especially under light load conditions. Operation which is characterized by short "on" periods is usually associated with poor humidity control, since relative humidity tends to rise much more quickly than temperature when there is no refrigeration during the "off" periods.

Check Low Pressure Cutout

The low pressure cutout is a factor in many cases of short cycling since there are a number of abnormal conditions that can cause it to trip. The purpose of this switch is to stop the compressor whenever the suction pressure drops below the normal operating range. For a cooling unit, the setting usually corresponds to a temperature of about 20 F. If the compressor were allowed to continue operation at this low temperature, condensate would start to freeze on the cooling coil. The ice buildup would continue until the air passage through the coil became substantially blocked and the unit capacity would be reduced to zero. In addition, the compressor itself might be damaged if it were of the hermetic type which depends on gas of higher density (at higher pressure) for cooling.

Short cycling due to low pressure is possible only when the switch is of the automatic reset type as compared with the type which must be reset manually once it has opened. Initiating the action of the switch are several conditions which must be detected and corrected.

A very common condition which leads to short cycling due to action of the low pressure cutout is the result of air filter neglect. Dirt accumulation blocks the air passage. Lack of air means lack of coil load. Since space temperature is not satisfied, the compressor continues to operate and reduces the coil pressure and temperature. If not corrected, ice eventually forms and further reduces air flow. When the suction pressure drops below the control setting, the first tripout occurs and stops the compressor. As soon as the pressure has risen (when the unit is shut down) above the control cut-in point, the contacts reset and the compressor restarts. The cycle then repeats until the initiating condition is corrected.

Other causes for a low pressure tripout are the following:

- 1) Restricted flow through liquid or suction lines due to clogged strainer screens or closed valves.

THIS NEW SERIES, based on actual interviews with dealers, covers known problems and suggestions for improved techniques in engineering, installing and servicing of residential air conditioning systems and their components. Previous series by S. W. Reid have been published continuously since August 1952, beginning with fundamentals and continuing through the treatment of specific problems since the fundamentals series was concluded in January, 1954. Highlights of the previous discussions and a preview of things to come are listed below:

Previously covered are . . .

A case history in which a low capacity complaint was solved through changes in design to reduce the cooling load June 1956
 An illustration of the importance of thorough analysis of trouble on the first service call May 1956
 Details for planning piping systems and selecting pumps for cooling tower and evaporative condenser installations April 1956
 Methods by which heat gains can be reduced . March 1956
 Modernizing a gravity system to provide year 'round air conditioning in an old house Feb. 1956
 Controlling humidity regain with cooling coil bypass when the condensing unit is off Jan. 1956
 Sizing refrigerant lines for remote installations . Dec. 1955
 Determining if the blower used for an existing warm air heating system is large enough for summer cooling Nov. 1955
 Eight combinations for arranging heating and cooling equipment, the advantages and disadvantages of each Oct. 1955
 Review of air flow patterns for cooling applications with recommendations for selecting and locating registers Sept. 1955

On the fire are . . .

Problems involved in converting water cooled equipment to air cooled equipment
 Effect of introducing outside air into a residential air conditioning system
 Effect of oversizing and undersizing cooling equipment
 Important factors to weigh when installing evaporators

2) Improperly adjusted expansion valve where the coil superheat is much higher than it should be indicating that the valve is not passing enough liquid.

3) Insufficient refrigerant in the system resulting from a leak.

4) Overcharge of oil in the system.

5) Too high a setting of the trip-out pressure.

6) Insufficient air quantity.

Watch High Pressure Switch

Like its low pressure counterpart, the high pressure cutout stops the compressor only when an abnormal pressure develops. If the switch resets automatically upon a drop in the high pressure, it can cause the compressor to short cycle. If it is manually reset, the compressor will, of course, remain off until the reset button is pushed.

Action of the high pressure cutout is initiated by conditions which cause high pressure in the condensing side of the refrigeration system. The trip-out point must be high enough so that it is not reached in normal operation. For air conditioning units this pressure usually corresponds to a temperature of about 130 F.

Scale Builds Head Pressure

One of the most common conditions that causes high head pressure is the buildup of scale on the water side of a water cooled condenser. Scale reduces the rate of heat transfer from the refrigerant to the water and thereby effectively reduces the capacity of the condenser. The result is a rebalance of the compressor and the condenser at a higher condensing pressure (and temperature) for the same water temperature. Tube fouling is a gradual process that may not be noticed until the high pressure cutout trips unless the air conditioner is serviced regularly. The condition is corrected by a chemical cleaning of the tubes and is prevented by a chemical treatment of the water. Where cooling towers are used, even in areas where the water is relatively low in mineral

content and no chemical treatment is required, a constant bleedoff of some water must take place to prevent salt concentration by evaporation.

There are a number of other circumstances which cause the high pressure cutout to trip:

1) Insufficient condenser water due to improper setting of the water regulating valve, to a partially closed valve, to improper pump application, to clogging of a water line, a strainer, or cooling tower nozzles.

2) Improper setting of high pressure cutout point.

3) An overcharge of refrigerant which collects as liquid in the condenser and thereby reduces the amount of surface available for condensing.

4) A partially closed discharge service valve.

5) Air or non-condensable gas in the system.

6) Inlet water too warm.

Is Motor Overloaded?

The last of the four sets of contacts which can cause short cycling is found in the motor overload device. For small, hermetic compressors with single phase motors, this device may be located on the motor

end of the casing where it is sensitive to both current and motor temperature. For larger motors and for all three phase motors, the device is usually built into the magnetic starter.

Overload protectors used with small compressors are more likely to be the automatic reset type than are the ones in the starters for larger compressors. The trend, however, is toward the manual reset type for all compressors. This assures that attention is called to the tripout, since the compressor will not restart until a button is pushed. It also, of course, eliminates the possibility of short cycle operation due to the opening and closing of the contacts in the electrical overload device.

Some of the same conditions which lead to a tripping of the high pressure cutout also may lead to tripping of the overload device which is sensitive to both electrical current and temperature. Generally speaking, a rise in head pressure is accompanied by a rise in the load on the compressor motor and an increase in the current which it draws.

The overload device is intended to stop the motor before it can be damaged from overheating. Current alone is not a sufficient measure of a potential danger, because a cool motor can withstand a heavier load than can a warm motor. Among the conditions which may cause the overload device to trip are the following:

1) Low voltage at the motor terminals.

2) High head pressure.

3) High return air temperature (during pulldown or too much outside air).

4) Incorrectly sized overload device.

5) Faulty overload device.

6) High ambient temperature in compressor compartment.

7) Low suction pressure (where gas density is not sufficient to cool a gas cooled hermetic compressor properly).

8) Shorted or grounded motor.

Subsequent articles will discuss some methods a serviceman can use to detect and correct conditions which cause short cycling.

What Is 'Air Conditioning'?

The American Society of Heating and Air-Conditioning Engineers defines air conditioning as follows:

"The simultaneous control of all, or at least the first three, of the following factors affecting both the physical and chemical conditions of the atmosphere within a structure: temperature, humidity, motion, distribution, pressure, dust, bacteria, odors, toxic gases, and ionization."

Reference: Heating Ventilating Air Conditioning Guide 1956, page 1. Published by the American Society of Heating and Air-Conditioning Engineers, New York.



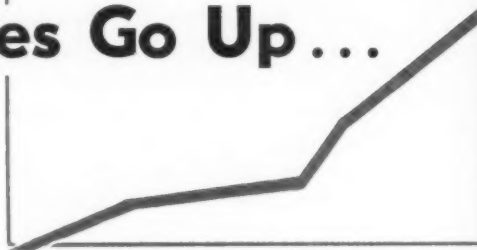
This is another in a regularly-scheduled group of articles appearing in American Artisan under the general heading "TRAINING PROGRAM". IN PRINT." These articles are especially prepared to help dealers in developing know-how in all phases of their organizations. Previous articles discussed:

1. Electrical problems as they affect the dealer's air conditioning installations.
2. Humidity control using a heat pump.
3. Various techniques for better management.
4. Methods of air distribution for modern homes.
5. Installing cooling in a wet heat house.
6. Effective presentations for selling architects on warm air heating for school buildings.

This month we turn to investigation of a well rounded summer cooling promotion program that starts early and uses available techniques to best advantage.

When Promotion Starts Early —

Cooling Sales Go Up ...



Systematic advertising, planned in advance and combined with proved sales techniques and promotion ideas, pays off in sales records for summer air conditioning equipment

IT TAKES A WELL rounded sales promotion program to make contact with most of the prospects for central residential cooling equipment in and around Washington, D.C., according to Victor T. Fahringer, sales manager, heating and air conditioning department, John G. Webster and Sons. Mr. Fahringer believes in starting his cooling sales promotion program early. This year it began in January when it was announced in the Sunday editions of the city's three newspapers. The announcement took the form of an eight page supplement (10½ × 14½ in.) in two newspapers and a 12 page supplement in the third. The 12 page supplement also was mailed to 40,000 people whose names were taken from the company's prospect file.

The newspaper inserts were followed up with a week long open house where between 11,000 and 12,-

000 persons visited the company's showroom. The company provided free refreshments for visitors from 9 a.m. to 9 p.m. each day. Other activities designed to retain prospects in the showroom were periodic door prize awards (\$4000 in prizes was given away during this week).

The effectiveness of the open house and newspaper campaign is evident from the 30 central cooling systems sales made during February, 1956. (This figure was up substantially over cooling sales made during February, 1955 when no special effort was made to locate prospects.)

Agency Directs Promotion

The advertising program is under the direction of a professional advertising agency, which is paid on a commission basis to prepare and place the advertisements. The com-

...Up

...Up



PROSPECT PARTICIPATION provides a key to maintaining initial interest and building new interest. The prospect is asked to help when measurements are taken and he is told why this was done

pany schedules its advertising according to anticipated annual sales volume and allows three to six percent of this dollar volume as sales promotional expense. The advertising agency is paid from this allotment.

The frequency of summer advertising depends on weather conditions and the volume of business on hand.

The appeal is changed to match buying moods of the public. In the spring the ads stress such enticements as "Don't Swelter this Summer," "Free Survey and Estimate," and "Four Years to Pay." Such ads usually carry a sample of the price schedule for various types of houses and list split-level, rambler, semi-detached, duplex, single floor and multi-floor types. Prices are quoted on the basis of square foot area of the house, with the equipment model given. It is clearly pointed out that the prices quoted are the lowest for the size of house mentioned — alterations and other special work will raise the quoted price. However, it is also made clear that the quoted prices, where they apply, do include the complete installation.

Alterations that would increase the price might be replacement of electrical service lines to provide the



PROSPECT IS SHOWN how the data he helped obtain is used to select the equipment required to provide comfort in his home



THE FOLLOW UP after installation is completed often provides a good source of leads for other sales



additional electrical power needed, or using extra supply ductwork for additional cooling capacity to a specific room. Additional costs also will be incurred if other than air cooled equipment is desired.

Testimonials Add Appeal

The ad further appeals to the home owner by using the photograph of a well known local personality, along with a testimonial letter. The May 6 ad featured a radio and TV star who uses an air conditioning system installed by the company several years ago.

Using the theme that experience is the best measure for selecting the company to install the cooling equipment, the John G. Webster Co. plays up its installation and service policy with the declaration, "We have installed and serviced air conditioning units of all types and sizes and we

constantly maintain a large force of the area's most experienced men."

In spite of the large advertising budget, the company continues to get about one-third of its customers from recommendations of satisfied owners. Mr. Fahringer explains that this desirable dealer-customer relationship is largely attributable to the manner in which the salesmen are schooled to deal with prospects. No effort is made to make the work appear technical or complicated. Instead, the prospect is encouraged to help out with every step of the survey. He is asked to hold the tape measure, and the reason for measuring a room is explained as this is being done. The prospect is shown how the measurement of the room is used to select the equipment needed.

Salesmen Check Performance

Once the equipment has been installed, the salesman calls back to verify the company's promise that the equipment is serving the customer as promised. Any minor complaints are quickly handled and during the follow-up procedure, the salesman will quiz the customer about any of his friends who have shown an interest in the cooling equipment.

The company employs six full time salesmen, each assigned to a specific area, and to take quick advantage of telephone inquiries, several of the salesmen have installed mobile telephones in their cars. Often

the salesman will be knocking at the prospect's door 15 minutes after receiving the call. This fast response catches the prospect while his interest is still high and the information provided by the salesman cultivates this interest.

Prospects for summer cooling equipment are obtained from the service record forms. One of the daily duties of Mr. Fahringer's secretary is to check the service reports for comments made by servicemen relative to sales possibilities. The follow-up by a salesman soon after a prompt and satisfactorily completed service call makes for good relationship between customer and company and sets up a sales presentation for cooling equipment.

Direct Mail Proves Effective

Direct mail pieces are sent out periodically to prospects obtained from the old customer list. Keeping this list up to date and the mail pieces recorded on the cards helps to tabulate the effectiveness of the direct mail program. The most effective mailing piece is a small ($3\frac{1}{4} \times 6\frac{1}{4}$ in.) six page envelope stuffer which quickly gives the ABC's of cooling, using photographs of equipment to demonstrate the points being made.

The attractive showroom plays an important part in stopping prospects who are shopping for window cooling units. The display for this type of equipment is realistically ex-



NEWSPAPER PROOF OF FULL page ad is checked against the original layout which was planned by Victor T. Fahringer, manager of the heating and cooling department, John G. Webster and Sons Co.



TELEPHONE INQUIRY TO office is given to salesman John R. Smith on the mobile 'phone in his car. Quick response to inquiry helps to maintain prospect interest

hibited by an exact reproduction of an exterior wall of a house. The windows are typical of those found in most houses today. The purpose of this display is to develop the prospect's interest in summer cooling. The various types of installations are described, and as the prospect listens to the sales presentation the conversation is gradually turned to central system cooling, the various ways that this can be added to existing warm air systems or how it can be installed where central warm air systems aren't used.

Explain Central Cooling

Close by the window cooling unit display is a furnace with a cutaway view of the component parts of the heating equipment. Attached to the furnace is a working model summer cooling unit. The prospect is shown how air is drawn into the equipment and discharged into a duct system after it has been cooled and moisture has been recovered. The number of upgraded sales from window cooling unit inquiries to central system cooling has increased considerably since the comparison displays have been located adjacent to one another.

All prospects entering the showroom are given an 11 × 15½ in. four page handout that reviews the information given by the salesman. It's been found that prospects who will not commit themselves in the showroom will study this literature, recall the salesman's comments, and review the possibility of the use of a central cooling system for their homes in preference to window units.

Homeowner Discovers Cooling

When salesmen are making calls in new housing areas where the occupants have put in at least one summer without summer cooling comfort, they make it a practice to push at least five door bells a day, tell the ladies of the houses about central cooling systems, leave copies of the handout literature with the invitation to talk it over with their husbands and to think about avoiding the heat and humidity of another summer.

5 Steps In Locating Sales Prospects



1 Service call reports are scanned by office secretary for leads to likely prospects



2 Another possible source is files of previous customers, considered a gold mine for leads



3 Newspaper advertising gives the facts. Full page ads in daily and Sunday papers pay off in inquiries



4 Showroom display helps point out the equipment needed to convert warm air heating equipment to year 'round air conditioning system



5 Canvass calls on houses which have experienced the first summer without cooling brings about numerous prospects

Train Salesmen to Sell



A Package of Comfort

A review of the job to be done will help the dealer's salesmen prepare a basis for a professional sales program

By Robert G. Mihan
Merchandising Consultant

UP TO NOW we have analyzed the job to be done in order to produce noticeable results in the form of increased heating and cooling equipment sales. We have established what makes a professional salesman, described the man who will do the best selling job for the warm air heating-cooling dealer, and presented some tested techniques for developing and closing the sale.

Perhaps at this point it would be profitable to stand back and look over the job to be done, weaving the things we know into a pattern which will pay off in sales.

First of all, we are selling comfort — a condition with universal appeal — in the form of a year 'round air conditioning package. Most of us have found that sales of both heating and cooling systems — not necessarily as a package — increase substantially when we start off selling the complete year 'round system. In other words, the dealer who talks up summer cooling when he is closing a sale of heating equipment — the salesman who recommends sizing the heating duct work to handle a future summer cooling system — is setting himself up in his prospect's eyes — and in the eyes of his prospect's friends — as a dealer in year 'round comfort.

So in effect, we have a pre-sold market. And we have a product which instills enthusiasm in our salesmen because of its universal appeal. What we have been doing is presenting a case for the salesmen to set before the

market in a way that will overcome the market's individual objections, price or otherwise, and create in our prospects the desire to become customers.

I have talked to salesmen in training sessions who have absorbed all the fundamental selling principles yet freeze up when they try to apply them in the prospects' homes. Some of them ask for "canned" sales presentations. However, putting actual words and phrases in the salesman's mouth is not practical. We have emphasized the importance of putting across the salesman's personality in his presentation, and this cannot be done with a memorized sales pitch consisting of someone else's words and applying to general conditions. Actually, what most of these salesmen need is a complete understanding of what they are selling — possibly they are trying too hard to put across the fundamentals of selling rather than the product they are presenting.

What we are selling does not require memorizing, but a subconscious awareness. It boils down, in the case of year 'round air conditioning, to an eight point package of comfort: 1) heating; 2) cooling; 3) dehumidification; 4) humidification; 5) clean air; 6) circulated air; 7) ventilation; 8) cash savings in cleaning and maintenance.

It Takes Some Selling

The extent of our success in selling year 'round air conditioning depends on our ability to help home owners, architects and builders to become aware of the features

of our product and the advantages of truly modern living which no other single home improvement has afforded in modern times. Keep in mind that it took some selling to convert television, refrigerators and automobiles from the luxury class to necessity items.

Just as salesmen in the past have proved the need for these items, so must the heating-cooling salesman prove the need for year 'round controlled temperatures. To go a step farther, it is necessary for him to convince the homeowner that year 'round air conditioning — or either of its components — will provide so much in healthful and comfortable living that the equipment will be worth more to him than its cost.

Here are 13 points to help salesmen organize a complete year 'round air conditioning sales program:

1) Prepare personalized mailings aimed at:

- a) The home.
- b) Small professional buildings.
- c) Small commercial establishments.
- d) Motels.

Be sure salesmen know how to follow up these leads effectively. Obtain periodic reports of salesmen's activities in this direction.

2) Equip salesmen with these selling tools:

- a) Literature and specification sheets.
- b) Order pads.
- c) Sales promotion aids.
- d) Load calculation sheets.
- e) Samples of warranties.
- f) Testimonials from satisfied users.
- g) Pictures of customers' homes and equipment.
- h) Before-and-after pictures of modernization jobs.

3) Arrange for customer credit accommodations and show salesmen how to present the "few cents a day" approach as discussed in the April American Artisan.

4) Survey the area for potential sales volume.

- a) How many have warm air heating systems?
- b) How many have obsolete or inadequate systems?
- c) Classify prospects as to their ability to pay for a better heating or cooling system.

5) Advertise in newspapers, television and radio.

6) Have an operating showroom display.

7) Invite women's clubs to attend summer demonstrations and permit them to hold meetings in air cooled comfort if space permits. Suggest that the women bring their husbands to these demonstrations and meetings.

8) Offer sales contests.

a) Provide prizes for salesmen selling the most equipment.

b) Offer special bonuses for heating-cooling package sales.

c) Make contests periodical events.

9) Cooperate with builders and install air conditioning in model homes.

a) Share builders' costs of advertising open houses.

b) Attend builders' open houses to locate heating-cooling prospects.

10) Provide salesmen with cost estimating data.

11) Offer a guaranteed "service certificate program":

SELL THIS 8 POINT PACKAGE

1. Heating
2. Cooling
3. Dehumidification
4. Humidification
5. Clean Air
6. Circulated Air
7. Ventilation
8. Cash Savings in Cleaning and Maintenance

a) Service fee includes such guarantees as new filter installed at beginning of the second heating season.

12) Hold periodic sales meetings for sales training and to stimulate interest in contests.

13) Post standings of salesmen in contest.

Sell Health Aspects

The subject of health as it is affected by air conditioning is one of the salesman's most powerful approaches. While the subject is too broad to be covered in this month's review, a brief mention of its importance will provide some food for thought in the dealer's organization of his sales presentation.

The salesman who can determine that a member of his prospect's family suffers from: 1) hay fever and other pollen allergies; 2) asthma and other nasal disorders; 3) heart disease, has a big selling point which will find a receptive audience.

Here a word of caution should be injected — it's easy to become carried away by a selling point as strong as this, but remember we're dealing in human lives and well-being. Salesmen should be careful to explain that air conditioning will help relieve these conditions only while the subject lives or works in an air conditioned space. Also that air conditioning will not cure these ailments but will provide relief.

Case Histories Sell Commercial Jobs

We are all familiar with the rise in sales in retail stores that have installed summer cooling and the increase in productivity of employees in offices with controlled temperatures. We know also of businesses which have lost sales to competitors who installed year 'round air conditioning. A professional salesman will use these stories to good advantage to increase sales to small commercial and business establishments.

This discussion has been presented solely to help acquaint the heating-cooling salesman with some of the material he has to work with. There's plenty of it every way we turn. It's a matter of organizing this material into a pattern which will convert a receptive market into a rising sales curve.



Split Level Some Air

Five day examination by the NWAHACA Mobile Laboratory

current question of whether proper system design need be sacrificed

THE GROWING TREND among America's home owners seems to be toward three-and four-bedroom houses with interior and exterior features that make the house distinctive in appearance from the other houses in the neighborhood. Architects find split-level houses provide the most economical answer to this popular leaning.

Split-level houses usually present the air conditioning engineer with difficult layout problems. The various levels make it easy to overheat or overcool certain parts of the house and difficult to heat or cool other parts. There is also the problem of draft caused by air flowing from one level to another. These problems are characteristic of all forms of heating, with the air distribution system being best adapted to split-level heating and cooling because it is possible to control much of the air flow between levels.

Mobile Lab Conducts Tests

To obtain detailed information about the performance of air distribution systems used for split-level houses, the National Warm Air Heating and Air Conditioning Association during the winter of 1954-55 sent its mobile laboratory staff out to secure five-day records on a number of these houses. The information obtained has been summarized and is presented here by permission of NWAHACA with suggestions that would improve comfort and equipment performance.

This is the second of a series of five articles dealing with the subject of heating and cooling split-level houses.

This perimeter heating installation is a good illustration of the fact that a good system requires more than a

set of modern diffusers located at the exposed perimeter of the building. In other words, a brief examination of this system would give the impression that the installation was as modern as any in the field. The operating performance, however, was another story.

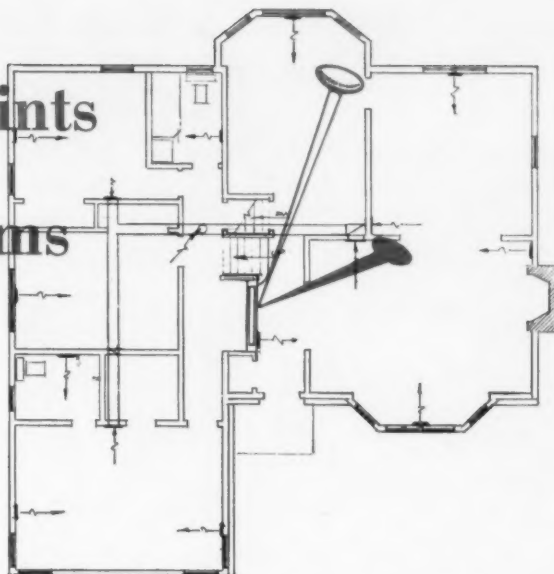
This is a split-level house with a full basement under the center level and the garage beneath the master bedroom. In common with many split-level houses, the structural framing was designed with little, if any, consideration for the space required for installation of the heating and air conditioning ducts. In this particular instance, it was literally impossible to run concealed ducts from one end of the house to the other unless they were installed within the rooms and furred in. The alternative is a duct system with turns and restrictions and resultant high static pressure loss.

The outside walls are covered with cedar shakes except for an area in the front which is brick veneer. The upper and center levels constitute the living area, with three bedrooms (one referred to as a den) and two baths on the upper level; a living room, dining room, and kitchen on the center level; and a half bath and recreation room on the lower level. There is a full basement under the entire second (center) level area. The lower level is on the same elevation as the garage, and the unheated garage is directly under the master bedroom. The basement floor is below the level of the recreation room. The basement walls are poured concrete, 12 in. thick. The floor is a 4 in. thick slab. About half the basement foundation is above grade and exposed to the outdoor air.

The walls generally are of frame construction with cedar

Heating Test Pinpoints Distribution Problems

results in some new solutions to the
for the sake of distinctive appearance



DISTINCTIVE DESIGN is achieved with little consideration given space for duct work. Three bedrooms and two baths are on upper level; living room, kitchen and dining room are on center level; half bath and recreation room constitute lower level. Basement is under center level and garage is below master bedroom

shakes on 1 in. wood sheathing and paper. Dry wall construction is used on the inside surfaces of both walls and ceiling, and both are insulated with 2 in. thick batts. All windows are wood, double hung, and all are provided with storm sash. The outside doors are loose fitting, and equipped with storm doors.

This house was completed in 1954 at a cost of \$23,000, including the cost of the garage and land. The building showed some signs of deterioration at the time of the test; the technician taking the performance data reported the brick veneer on the front of the house was pulling away from the sheathing.

The design heat loss is 65,861 Btuh for the living area and the recreation room and 13,144 Btuh for the basement, making a total of 79,005 Btuh for the entire structure. The design temperature is zero F and the average degree day total for the locality is about 5300 for a season.

Year 'Round System Tested

This is a year 'round system. The cooling equipment, including the compressor, is in a separate cabinet adjacent to the furnace casing. The same blower is used for both the heating and cooling cycles. The furnace is a lowboy model with an output rating of 136,000 Btuh at the bonnet. An oil burner is used with a 1.30 gph rated nozzle. The summer cooling unit is rated at 3 tons.

The furnace supplies an extensive rectangular duct system with smaller rectangular takeoffs leading to the

registers. There are eleven side wall perimeter diffusers on the two living levels, five of them on the center level and six on the upper level. All of them, with the exception of those in the bathrooms and one in the entrance hall, are on outside walls beneath the windows. Two ceiling registers in the recreation room and one in the half bath are furnished to heat the lower level. There are no warm air outlets in the basement; the only heat entering this area is the vagrant heat loss from the furnace and the exposed ductwork. There are four high side wall return air intakes on the upper level, two on the center level and one low wall intake in the recreation room which were connected to the furnace by a complicated return air duct system.

The cooling unit is connected into the duct system in such a manner that when the dampers are in the cooling position the conditioned air does not pass around the heat exchanger.

Of the eleven low wall registers used, four are 12 × 6 in. and seven are 10 × 6 in. models. Two ceiling diffusers are located in the recreation room and one ceiling diffuser is in the half bathroom for the lower level.

Return air intakes are located in each of the three bedrooms, in the hall ceiling (to the attic duct), in the living room and in the dining room.

With this information, the Mobile Laboratory began setting up its equipment and taking tests on a Monday morning. The tests covered a five day period, 24 hours a day. The prevailing weather for the five day period ranged from 4 F on the coldest day to 34 F on the warmest day. The evaluation of the data obtained has

"There is a noticeable air movement over the ledge of the bedroom hallway between the stairs and the front entrance hall."

TABLE 1—HEAT LOSS and air distribution data is based on a design temperature of Zero F

room	heat loss	cfm (calculated)	no. diffusers
Bedroom 1	11,715	83	2
Bedroom 2	6,566	26	1
Bedroom 3	4,455	31	1
Hall	3,964	38	1
Living Room	9,396	96	2
Dining Room	6,470	51	1
Kitchen	7,806	51	1
Bath 1	included with bedroom 1	35	1
Bath 2	included with bedroom 2	25	1
Recreation	15,489	50	2
Bath 3	included with recreation room	35	1
Basement	13,144	0	0
	(heated by vagrant casing and duct loss)		
Totals	79,005	521	14

been based on a temperature of 6 F and projected through the use of engineering formulas to estimate the performance of the equipment under design conditions. An evaluation of this system revealed the following conditions and is responsible for pertinent comments made by the engineer performing the analysis.

Duct Runs Are Too Long

The duct system is most unusual in many respects. The use of a long 12 × 3½ in. ceiling duct to the dining room could have been avoided by installing a short duct from a nearby trunk. The requirements that the furnace be located at one corner of the basement meant duct runs to the far bedrooms had to be extremely long, with a resultant substantial drop in the delivery temperature of the air. The use of a single register in a room having a design loss of 6566 Btu appears to be inadequate engineering since the register is located about 50 duct feet from the furnace.

The return duct system is also one of the most unusual arrangements observed in a number of surveys. The devious path and the restricted sections create unduly high static pressure losses. Apparently in order to overcome the restrictions, the blower speed had been increased to the point where excessive noise is produced. Also, the return air plenum pops in and out each time the blower starts.

Room Temperatures Vary

The system is far from being adjusted in accordance with CAC (comfort air circulation) principles. Blower operation was intermittent when outdoor temperatures were as low as 6 F. This type of blower operation results in a wide range of air temperatures at the registers. A wide range in supply air temperatures results in an un-

satisfactory relationship between different levels within a room and between rooms.

The problem of heating the recreation room is difficult since the overhead registers produce stratification at the ceiling and a low air temperature at the floor level. This situation is aggravated by cold floor surface temperatures which indicates that rooms located over floors at or slightly below grade level should be insulated at the edge of the slab and have their heat supplied through ducts imbedded in the slab, with registers located at the perimeter of the room.

The sheet metal work is not up to the usual standards of the industry. The Mobile Laboratory technician noted that the joints between the sheet metal duct sections are not tight and in some instances there is considerable air leakage from them.

Too Much Vertical Temperature Difference

The average temperature difference of 6.8 deg from floor to ceiling for the two upper levels is equal to 1.08 deg for each change of 10 deg in the indoor-outdoor temperature difference. This is rather large. The temperature difference from floor to ceiling in the recreation room is 19.1 deg or a temperature change of 2.90 deg for each 10 deg change in the indoor-outdoor temperature difference.

The average temperature difference of 3.0 deg from the floor to the 30 in. level for the center and upper levels is equal to 0.45 deg change for each change of 10 deg in the indoor-outdoor temperature difference. This is not particularly low. For the recreation room in the lower level the difference of 7.4 deg is equal to 1.12 deg change for each 10 deg change outdoors.

On the center and upper levels at the 30 in. level, the living room is the warmest at 73.2 F and bedroom 2 is the coolest at 71.4 F. The lowest temperature at 3 in. above the floor level on the upper two levels is 66.6 F in bedroom no. 1, over the unheated garage. The warmest floor area is in the dining room (77.5 F) which is affected by the warm air ducts located between the floor joists. The temperatures of the floor in the corners of the rooms vary with wall exposure.

Air Movement Is Noticeable

There is a noticeable air movement over the ledge of the bedroom hallway between the stairs and the front entrance hall. This ledge is enclosed by an ornamental grille railing. The 71.9 F temperature of the air at the 3 in. level in the living room does not indicate a pronounced movement of cold air dropping over that ledge

(Continued on page 92)

HOW WOULD YOU DO IT?

... this way?



ROOF VALLEY DETAIL

Fig 1

... or this way?



ROOF VALLEY DETAIL

Fig 2

In Fig. 1 above, the detail shows that the valley is connected to the metal roofing sheet with a $\frac{1}{4}$ " wide unsoldered seam.

In Fig. 2 the valley sheet extends up under the roofing pans at least 6" and the roofing pans are connected to the valley sheet by a $\frac{1}{4}$ " lock as shown.

The method shown in Fig. 1 can be the cause of many leaks that occur at a valley. When you consider that no other roofing material

would be installed to lap over the valley flashing $\frac{1}{2}$ " it doesn't seem logical that because the roof covering is metal a $\frac{1}{4}$ " lap will not leak.

To avoid any chance of leak trouble either method shown in Fig. 2 should always be employed. Should the water be diverted against this lock by ice, leaves, sticks, etc. that might lodge in the valley, no leaks will occur because a head lap was provided.

We do not wish to presume to tell you how to install gutters, leaders, roofs, flashing, coping covers, etc., because there are many methods which you no doubt have found to be satisfactory. The purpose of this advertisement is to point out the methods of installation that have been proved by many years of use, and backed by more than a century and a half of experience in working with copper, to be the most satisfactory techniques. You will find these methods in Revere's 110 page brochure, "COPPER AND COMMON SENSE." Send for a copy today. And remember: Revere has a staff of specialists known as Technical Advisors, whose experience qualifies them to render valuable service and advice regarding the use of metals in the building field. Feel free to consult with them at all times regarding the use of Revere Copper; you incur no obligation. Revere Technical Advisors may be contacted through the Revere Office nearest you.



REVERE COPPER AND BRASS INCORPORATED

Founded by Paul Revere in 1801

230 Park Avenue, New York 17, N. Y.

Mills: Baltimore, Md.; Brooklyn, N. Y.; Chicago, Clinton and Joliet, Ill.; Detroit, Mich.; Los Angeles and Riverside, Calif.; New Bedford, Mass.; Newport, Ark.; Rome, N. Y. Sales Offices in Principal Cities, Distributors Everywhere.

National Advertising that
creates interest...

Sales Promotion that
attracts inquiries...

Co-op Allowance that
gives your **local advertising**
effort a lift...



*You get so much more
... with*

MOR-SUN

HEATING AND AIR CONDITIONING

Here are the reasons YOU should be a Mor-Sun Dealer...

A COMPLETE LINE of warm air heating and air conditioning equipment.
QUALITY DESIGN AND CONSTRUCTION that ensures customer satisfaction.
THE RIGHT SIZE... THE RIGHT PRICE for every home heating and cooling market.

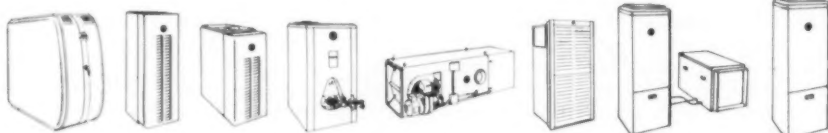
NATIONWIDE DISTRIBUTION with immediate delivery from local stocks.

SALES TRAINING sponsored by Mor-Sun — practical, professional "how-to-sell" instruction.
NATIONAL ADVERTISING that pre-sells Mor-Sun, builds customer recognition and acceptance, boosts your business and profits.

SALES PROMOTIONAL HELPS, selling tools to help you interest the prospect and close the sale.
CO-OP ADVERTISING PLAN for your local use — newspaper, radio, TV, and other approved media.

FOR ALL THE DETAILS of one of the soundest business opportunities open to heating dealers, see your nearest Mor-Sun Distributor—he's listed in the Yellow Pages of your telephone directory—or write directly to: Mor-Sun Furnace Division, Morrison Steel Products, Inc., 609 Amherst Street, Buffalo 7, N.Y.

In Canada: Mor-Sun Ltd., Waterloo, Ont.



• There's a Mor-Sun Warm Air Furnace and Air Conditioner for every home heating and cooling requirement... the right size... the right price... for new construction or modernization.
Also manufacturers of Morrison Roly-Door Steel Sectional Overhead Doors and Morrison Service Bodies





THESE FACTS

are important to you!



Tecumseh

COMPRESSORS

are used in approximately 50% of
today's year-round air conditioners

As a contractor, you can build customer confidence by installing a year-round air conditioner that features a Tecumseh compressor. True, there are other compressors in use today, but Tecumseh has developed the only complete line of hermetic compressors specifically designed for air conditioning. This means the manufacturer using Tecumseh compressors offers more to both you and your customers.

PINPOINT PERFORMANCE

Every current compressor advancement is designed into Tecumseh compressors to give full rated performance under the toughest conditions associated with air conditioning.

GREATER SAFETY

Each compressor has double the oil supply necessary for proper lubrication. This allows an extra safety factor on pulldown. Most important, it helps protect internal parts when the compressor is started after cold weather shutdown.

LOW NOISE LEVEL

All moving parts are held to close tolerance and are constantly lubricated. Internal or external spring mountings resist vibration. Result — smoother, quieter operation.

COMPACT DESIGN

The popular answer in compressor design to meet the public demand for more cooling and smaller air conditioners, saving valuable floor space for other uses.

FULL HERMETIC

Outside causes of failure are eliminated by providing a foolproof hermetic seal. Suction gas cooling within stamped steel shell dissipates motor heat and effects cooler operation.

LOW INITIAL COST

Constant demand for Tecumseh compressors has kept prices down. The savings are reflected in the cost of the air conditioner, plus the many "extras" that are standard equipment.

FREEDOM FROM SERVICE

Tecumseh's superior operation has resulted in the lowest percentage of field returns under warranty for a complete system. Result — fewer service calls, saving you and your customers time and money.

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The World's Largest Producer of
Air Conditioning Compressors

TECUMSEH PRODUCTS CO.

Tecumseh, Michigan
Marion, Ohio

Tests Solve Split-Level Distribution Problems

(Continued from page 88)

and resulting in chilling the air in the rooms on the center level. There are ample return air intakes on the upper level, but it is probable that not all the air delivered to that area by the warm air supply outlets is returned to the furnace through them because of the devious path and high resistance of the return air trunk duct. This is evident from the flow rates shown in Table 1. What ever spillage does occur over the hall ledge is warmed by the warm air supply diffuser beneath it and the air temperature at the 3 in. level in the entrance hall is not noticeably affected.

The room air temperature variations during a burner cycle are about 3.5 deg and are accented during the "off" periods of the blower.

The total calculated air flow rate for registers is 521 cfm. The calculated air flow rate based on the return air velocities is 659 cfm. The calculated air flow rate based on the furnace heat balance is 1350 cfm. The furnace heat balance rate of estimating the air volume was not considered as reliable since the actual fuel input is not measured but determined from oil burner nozzle ratings. The value of 659 cfm determined from the return intake air flow is assumed to be the most nearly representative of the true air flow rate.

The return intakes in the living room and dining room account for 64 percent of the total air flow. The remaining five intakes handle 36 percent of the return air.

Return System Follows Devious Route

The duct static pressure on the return air side is greater than 0.21 in. of water, which is the scale limit of the draft instrument. The return air system follows an extremely devious and complicated arrangement. The worst restriction occurs in the two flat ducts against the basement ceiling, each duct being $12 \times 3\frac{1}{2}$ in. In other words, a total duct area of 84 sq in., or 0.583 sq ft is required to carry the entire air flow. The estimated air flow rate is 659 cfm. On this basis, the velocity through the two small ducts is about 1130 fpm. It is understandable with such high velocities that high pressure losses occur and that the total air flow is not as great as it should be. The simplest corrective measure would be to enlarge the size of the two flat ducts.

Noise Is Excessive

The noise generated by the system is far from satisfactory. The restriction in the return system is so severe that the blower apparently had been speeded beyond normal desirable limits. Furthermore, the return air plenum pops in each time the blower starts. The reduction of blower noise, therefore, will require a reduction in duct resistance and slowing the blower speed.

The investigator also noted a "hissing noise" from the burner; each time the burner produces this noise the flame dies down. This indicates the presence of restrictions in the fuel line.

At 6 F outdoor temperature the blower was not operating continuously. Obviously, the blower was not adjusted in accordance with CAC principles.

Occupants Are Critical of System

The occupants complained of drafts on the kitchen floor. Air movement is noticeable but it was difficult to determine where it came from and where it went. The air movement is accentuated when the door leading into the recreation room on the lower level is open.

The occupants are a middle-aged couple and a young man. They formerly lived in a house with a steam heating plant and were critical of the warm air heating system's performance. Besides the complaint about drafts on the kitchen floor they also complained about the difference in room temperatures and low temperatures in bedroom 1 and the recreation room.

Room Corners Are Cold

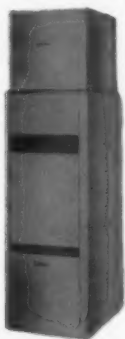
The floor surface temperatures were taken in the centers of the rooms as well as in the exposed corners and along exposed walls. None of the center reading temperatures were found to be below 66 F. However, that was not the case in the exposed corners and along the exposed walls. Here temperatures were recorded as low as 54.4 F in the dining room and 43 F in the recreation room.

The flue gas temperature is high and the CO₂ content of the flue gas is low with an apparent bonnet efficiency of 56 percent. The actual fuel input rate was not measured, so the air flow rate as determined by a furnace heat balance evaluation cannot be considered as reliable. (The rate of 659 cfm as determined by the return air velocity is considered as the best approximation of the true air flow.) Extrapolation of the burner data shows that for an outdoor temperature of zero F (design temperature) the burner would have a reserve capacity of 15 percent which is considered adequate.

An extensive series of corrective measures are indicated. Among them are redesigning the return air duct system; addition of heat to the far bedrooms; slowing down the blower; adjustments to the control settings; and adjustment of the fuel burner. Probably the floor temperature in the dining room and kitchen would be substantially improved if the basement were heated to a higher temperature than is possible from vagrant duct and furnace heat losses. Edge insulation of the floor slab in the recreation room would improve the floor temperature in that room.

COMBINATION SYSTEMS

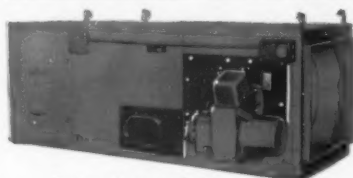
Engineered for
Modern Year 'Round Air Conditioning



Factory-assembled UTILITY,
gas and oil



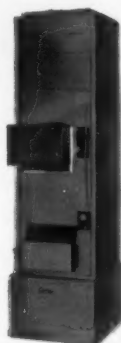
Factory-assembled LOBOY,
gas and oil



Horizontal, gas and oil



Remote Condenser,
air and water cooled



Counterflow,
gas and oil



Large Residential, gas and oil



Commercial, oil



Gravity, gas and oil

Conversion Gas Burner



Conversion Oil Burner



BE CONFIDENT WITH CENTURY...

*"the right unit for
every prospect"*



There is a Century gas or oil unit of the size, shape and capacity needed by any prospective customer. And each of the many Century units has the famous Century Engineered quality. Smart, modern, functional design makes sales easy . . . your profits big.

Customers want the silent efficiency offered by Century's Summer-Winter Air Conditioning. They can definitely be shown that the beauty of the Century line is more than skin deep!

It will pay you to inquire about Century — the heating and cooling line that's on the move.

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Company

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5 Ton
Year 'Round
Air Conditioner
Air or Water Cooled
Gas or Oil Fired



2 or 3 Ton
Year 'Round
Air Conditioner
Air or Water Cooled
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Counterflow,
2 or 3 Ton
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Gas or Oil Fired



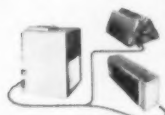
Water Cooled,
Add-On
2 or 3 Ton Summer
Air Conditioner



Basement Type
Winter
Air Conditioner
Gas or Oil Fired



Counterflow
Winter
Air Conditioner
Gas or Oil Fired



Air Cooled
2, 3 or 5 Ton
Condensing Unit with
Plenum Type "V" or
Duct Type "Flat"
Add-On Cooling Coil



Utility Type
Winter
Air Conditioner
Gas or Oil Fired



Gravity Furnace
Gas or Oil Fired



Horizontal Furnace
4 Gas Sizes
4 Oil Sizes



Gas Unit Heaters
5 Sizes



10 and
15 Ton
Commercial-
Industrial
Packaged
Summer
Air Conditioners

3, 5 and 7½ Ton
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Water Cooled



Your
ONE-STOP
Headquarters!

Everything
FOR HEATING
Everything
FOR COOLING
plus
SUREFIT® Snaplock
Pipe, Duct Fittings
for Any
Installation

Save time . . . Save money at "One-Stop"!

Now, at one place—your Moncrief Wholesalers' you can save on everything!

Whatever, you need, you'll find it—built better and priced right, because it's backed by Moncrief's 60 years of manufacturing experience.

The Moncrief line is the complete line that knows no seasons. From a single source, at competitive prices, you can buy:

- Any type or size of residential Winter Air Conditioner—Basement, Utility, Counterflow or Horizontal.
- 2, 3 and 5 Ton Year 'Round Air Conditioners that are either Air or Water Cooled, and either Gas or Oil Fired.
- 2, 3 and 5 Ton Air Cooled Condensing Units with

either "V"-type (Plenum) or Flat-type (Duct) Add-On Cooling Coils.

3 and 5 Ton Water Cooled, Add-On Summer Air Conditioners.

3, 5 and 7½ Ton, Store-Office, Summer Air Conditioners.

10 and 15 Ton, Packaged, Commercial-Industrial Air Conditioners.

Gas or Oil Gravity Furnaces, Gas Unit Heaters, Gas and Oil Conversion Burners and Gas Incinerators.

Moncrief Surefit Pipe, Duct and Fittings that are carton-packed, precision-manufactured and designed for speedier installation.

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• Medina, Ohio

HEATING AND AIR CONDITIONING UNITS

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— *without removing regulator from line*

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Save on control equipment cost too. Here in the Thermac Series SR Combination Pressure Regulator and Thermo Electric Safety Pilot you achieve in **ONE UNIT** not only the finest gas regulator available but an integral easy-to-get-at Safety Pilot which eliminates the need of an expensive electric relay or separate safety control.

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ASSISTANCE AND IMMEDIATE
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Management Specialist Tells

What Every Business Man Should Know

. . . to operate a profitable business and to keep from becoming a statistic as a "business failure"

By R. F. Coonley
Assistant Treasurer
Lennox Industries, Inc.

THIS ARTICLE IS WRITTEN for the purpose of offering a few suggestions relative to some financial problems facing small heating and cooling dealers. It is based on many years experience handling hundreds of small accounts as well as the personal acquaintance of many dealers engaged in the heating, sheet metal and cooling business. No effort has been made to be all inclusive or technical in the following comments.

In a book entitled "Behind the Scenes of Business" published in 1952, Roy A. Foulke, vice-president of Dun & Bradstreet, Inc., makes this statement: "Thousands of concerns go out of business during their first, second, and third years. The average life of a business enter-

prise is only about sixty-six months." This was written four years ago, but we doubt if the average would be much different today. Dun & Bradstreet last year added over 430,000 names to their yearly reference book, but, and this is important: almost an

The author, without exception, is highly qualified to discuss the subject, "What Every Business Man Should Know." An assistant treasurer of Lennox Industries, Inc., he has long experience in the credit field, having served as credit manager for Lennox in Syracuse for 16 years. Prior to joining Lennox he served in a Syracuse bank in the same capacity. He has a total of 25 years experience in this field.

equally large number was taken out. Obviously, the turnover is great.

Critical Point Is 5½ Years

It seems almost incredible that thousands of businesses do not survive the first three years, and the average only about five and one half years for all concerns. Yet you have only to look down the business streets of your own town to realize that many come and go during the span of a very few years. Many human interest stories could be written about some of these situations — the high hopes and future plans and expectations that were killed, the life savings of some that were lost, the humiliation and sense of failure of the owners, to say nothing of the losses to creditors in many instances.

Why is it so difficult to operate a successful business? Why particularly in our industry — and we are thinking now of the small furnace or

(Continued on page 100)



NOW!

a new source for galvanized sheets



JL STEEL

Now sheet metal users can look to a new, dependable source of galvanized sheets. Jones & Laughlin Steel Corporation is putting more than 100 years of steel-making experience behind its new facilities for the production of high grade galvanized sheets.

New J&L galvanized sheets carry on the J&L reputation for quality steel. Produced with uniform ductility, flatness, and surface finish, they are typical of J&L ability to produce to exacting specifications accurately and faithfully.

Galvanized by the proven Sendzimir process, J&L Galvanized Sheets have a tight uniform coat-

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J&L Galvanized Sheets are produced with a high-lustre finish that creates eye appeal and customer acceptance for your finished products.

The next time you order, remember—J&L Galvanized Sheets are available in both coils and cut lengths to fit your continuous operations. They work up easily—can be formed, rolled, drawn and cut to your satisfaction.

Available in a range of gages and widths to meet your requirements.

Get complete details today.

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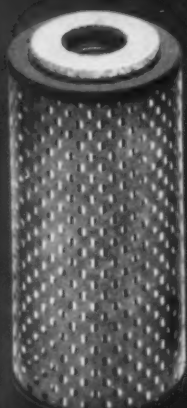




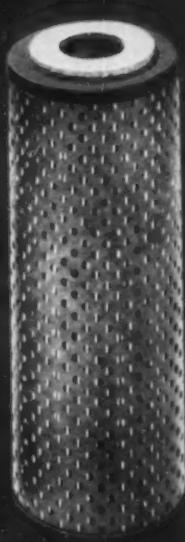
PF-2002 Filter
PF-200 Element



PF-63



PF-65



PF-67

CROSS REFERENCE CHART

MANUFACTURER	Filter Model	Filter Size	Filter Type	Filter Material	Filter Grade	Filter Rating	Filter Capacity	Filter Pressure	Filter Temperature	Filter Notes
CELESTON	5 and 10 A	PF 200	PF 65	PF 67	PF 68	PF 69				
	5 and 10 B	PF 200	PF 65	PF 67	PF 68	PF 69				
	5 and 10 C	PF 200	PF 65	PF 67	PF 68	PF 69				
APOLLO	5 and 10 A	PF 200	PF 65	PF 67	PF 68	PF 69				
	5 and 10 B	PF 200	PF 65	PF 67	PF 68	PF 69				
	5 and 10 C	PF 200	PF 65	PF 67	PF 68	PF 69				
PULOLATOR	5 and 10 A	PF 200	PF 65	PF 67	PF 68	PF 69				
	5 and 10 B	PF 200	PF 65	PF 67	PF 68	PF 69				
	5 and 10 C	PF 200	PF 65	PF 67	PF 68	PF 69				
LANTANA	5 and 10 A	PF 200	PF 65	PF 67	PF 68	PF 69				
	5 and 10 B	PF 200	PF 65	PF 67	PF 68	PF 69				
	5 and 10 C	PF 200	PF 65	PF 67	PF 68	PF 69				
PULOLATOR	5 and 10 A	PF 200	PF 65	PF 67	PF 68	PF 69				
	5 and 10 B	PF 200	PF 65	PF 67	PF 68	PF 69				
	5 and 10 C	PF 200	PF 65	PF 67	PF 68	PF 69				
PULOLATOR	5 and 10 A	PF 200	PF 65	PF 67	PF 68	PF 69				
	5 and 10 B	PF 200	PF 65	PF 67	PF 68	PF 69				
	5 and 10 C	PF 200	PF 65	PF 67	PF 68	PF 69				
PULOLATOR	5 and 10 A	PF 200	PF 65	PF 67	PF 68	PF 69				
	5 and 10 B	PF 200	PF 65	PF 67	PF 68	PF 69				
	5 and 10 C	PF 200	PF 65	PF 67	PF 68	PF 69				

PULOLATOR REFILL FEATURES . . . 0.005 MICRON FILTRATION • ONE SIZE FOR ANY CAPACITY • U.S. APPROVED 100 G.P.H. • FIVE TIMES MORE FILTERING SURFACE AREA

This handy guide shows you, instantly, the filter refills which may be used, interchangeably, in all leading filter units.

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4. Will not shrink, distort, stretch, flake or deteriorate.
5. A guaranteed filtering capacity of over 100 gallons per hour U.L. approved.

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Rahway, New Jersey

Please send me _____ copies of your Oil Burner Filter Element Cross-Reference Chart.

Name _____

Address _____

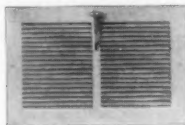
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sure signs of indoor comfort!

Standard Registers & Grilles

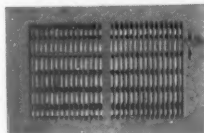
*... for custom control of
warm air heating*

*... for uniform, year-around
heating and cooling comfort*



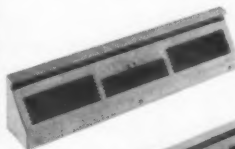
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WALL

SINGLE DAMPER FORCED AIR REGISTERS

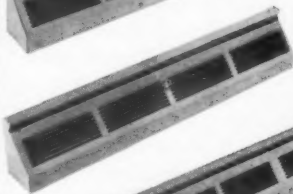


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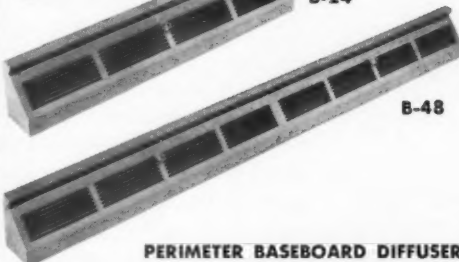
MULTIPLE VALVE SIDEWALL & BASEBOARD REGISTERS



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B-24

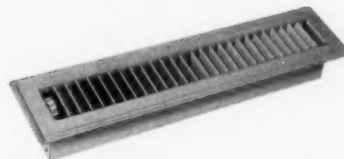


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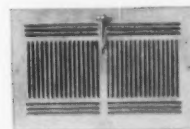
PERIMETER BASEBOARD DIFFUSERS



CEILING AIR DIFFUSERS (flush and extended)



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Also: return air grilles, baseboard and sidewall intakes, air cond. and ventilating returns, door grilles, floor registers, cold air faces, frames, ornamental metals.

Install Standard Registers and Grilles on every job to save time and increase customer satisfaction.

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Mail the coupon
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Gentlemen: Please send me your new catalog showing the complete line of Standard Stamping Registers and Grilles.

Name

Company

Address

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Maintain Adequate Working Capital

(Continued from page 96)

heating dealer — is the road too rough? Perhaps the basic reason or cause is a small dealer must combine in one man (himself) all the attributes that contribute to the success of so-called big business. He must be a good installer, a good salesman and a good manager. In other words, he must have a knowledge of production, financing, accounting, and selling or marketing. Big business can and does hire experts in some or all of these fields.

Articles in business magazines today point out that even big business has a crying need for good managers, so important is this phase of their activity. Is it any wonder that so many small dealers stub their toes as managers?

Working Capital Needed

What are some of the more glaring examples of poor business management? We doubt if they can, or should be, ranked in order of importance, but if there is one outstanding weakness among most small businesses, it is lack of adequate working capital. In most instances this weakness is the culminating effect of unwise policies, but it is the millstone around the neck of many a businessman. If it is not corrected, either by retention of earnings, change in policy, or in some cases by attracting additional outside capital, there can be only one of two results. One result is that eventually the suppliers become tired of supplying capital, which they are actually doing, and withdraw their support. In this event the business folds.



Assuming that the major suppliers will go along year after year with a small amount of credit, then the business will probably continue to exist, until some emergency arises, but it will never grow.

All of this sounds rather negative, but we believe it is realistic. However, the purpose of this article is to offer, in a humble way, some suggestions and comments which we hope may be helpful. So, let's discuss in a very general way a few of the more important pitfalls we have seen in many a small business.

Draw Accounts to Close

Do you promptly collect your accounts receivable, that spot where your money lies after the sale and



installation have been made? Don't forget your profit is in there too, and the funds needed to purchase the next unit, to pay a portion of the payroll, lights, and telephone and many other expenses. So why let it stay uncollected so long? Slow moving receivables are the curse of many a small dealer, and the slower they get the more potential loss there is in them. Many a small dealer has told us honestly that he just couldn't "ask my neighbor for payment." This policy just doesn't work.

When a sale is made and the order is given there is a contract, either verbal or written. When you have completed the installation you have fulfilled your part of that contract,

and your customer should be expected to fulfill his part of the contract promptly. There should be no hesitancy or embarrassment in asking for full payment. The funds are needed, and the smaller the business the more necessary it is to collect quickly. Inevitably, the customer who delays payment begins to find fault with his installation as an excuse for further delay.

Bill Promptly for Results

Some of the best small dealers we have known are those men who ask for payment immediately upon completion of the installation. Usually their procedure is something like this. In the evening of the day the installation is finished, or sometimes the following evening, the proprietor calls on Mr. and Mrs. Customer and shows them in detail what has been done. He points out to them with pride the neat installation, the beauty of the unit, shows them how it should be operated, and asks them at that time for any questions, criticisms or complaint. Usually there are no criticisms but if so they are adjusted quickly on the spot. Then while everyone is pleased and the owners are proud of their new purchase, the bill is presented with the idea that payment is expected promptly. Many small dealers whom we know have little difficulty in collecting the larger portion of their accounts receivable quite promptly on this basis. It is another story, however, when invoices are delayed a month in being mailed from the office or when no direct, prompt request is made for payment, and this is largely the fault of the dealer himself.

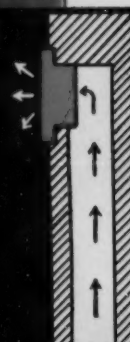
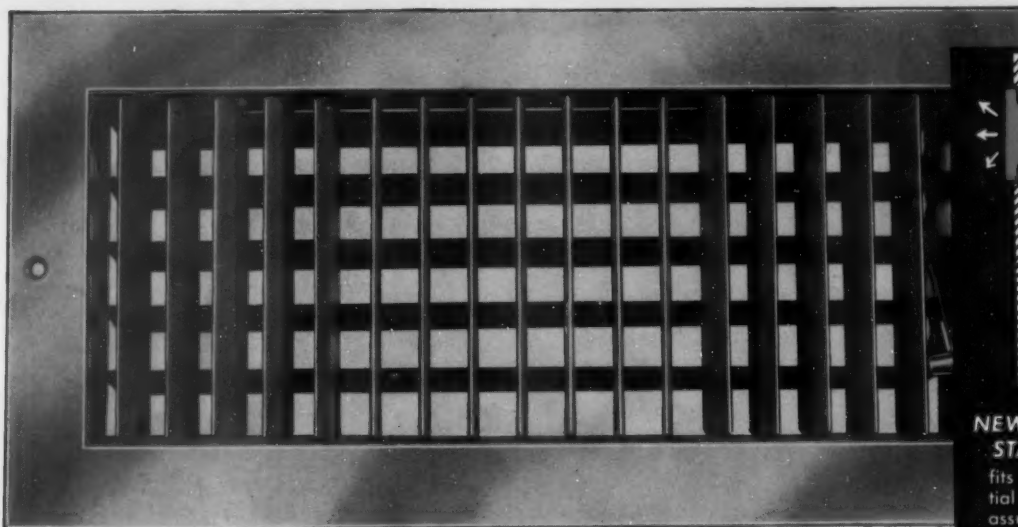
This also leads to the thought that a credit check should be made on any sale of any amount over a few dollars. It certainly is not good business to invest your own money and time making an installation unless you are reasonably sure that pay-

(Continued on page 106)

Now

FOR THE
FIRST TIME!

A Professionally Engineered Register for Residential Use



NEW NARROW STACKHEAD

fits all residen-
tial ductwork —
assures full heat
and air flow.

**ALL the top quality commercial grille
features for far superior performance
AT NO EXTRA COST!**

NEW GREATER ADJUSTABILITY

This Titus Style S-274 multi-shutter register, with individually adjustable louvers—provides air control NEVER BEFORE ACHIEVED in home air distribution. Makes any forced air heating or cooling system perform with superior efficiency. Multi-shutter damper for complete shut-off.

AMAZING NEW SOLID SECTION EXTRUDED ALUMINUM LOUVERS

Solid aluminum, streamlined louvers give super air control. Won't rust—corrode—or freeze up EVER! Quickly, simply, easily adjusted from face of grille—by anyone—for ANY air pattern desired.

NEW EASIER INSTALLATION

Simplest in the world to install. Just 2 easy steps (1) Fasten grille in place with screws (2) Adjust louvers for correct air patterns.

DON'T jeopardize the performance of your heating or cooling installations with inflexible stamped registers. **THEY SIMPLY CAN'T BEGIN TO COMPETE!** Underbid your competitors—and at the same time give your customers quality that cannot be duplicated BY SPECIFYING NEW TITUS PROFESSIONALLY ENGINEERED RESIDENTIAL AIR CONDITIONING OUTLETS. Write for complete details now.

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WRITE FOR FREE LITERATURE TODAY

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Gentlemen: Rush me latest literature, price lists & discounts on
your NEW PROFESSIONALLY ENGINEERED
RESIDENTIAL AIR CONDITIONING OUTLETS.

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NO DIFFERENCE IN FURNACES EXCEPT PRICE?

Have you ever installed *Sequoia* Gas Furnaces?

SEQUOIA

DESIGN makes one big difference—something we spotted on our job tickets just as soon as we began using Sequoia's. This Rev-Flo model is a good example:

Notice how all of my connection points are right on the face—and that I can easily reach my plenum and five outlets. I don't have to twist myself up like a rubber band to get this furnace in! Everything goes faster... even the pilot's right here and for final adjustments, the whole blower assembly is on a sliding drawer.

Little things? Sure—but added up they mean a lot of installation time saved. And in a cost conscious shop like our's, that's dollars saved!

SEQUOIA'S sales story to you, Mr. Heating Dealer, is simple. You can take your choice: (a) Make more profit per job, or, (b) Bid installations more competitively, or, (c) Deliver a better quality furnace at the same price.

YOU ARE INVITED TO WRITE FOR DETAILS ON THE COMPLETE SEQUOIA GAS FURNACE LINE TODAY



**ANOTHER
KEY SEQUOIA DEALER**

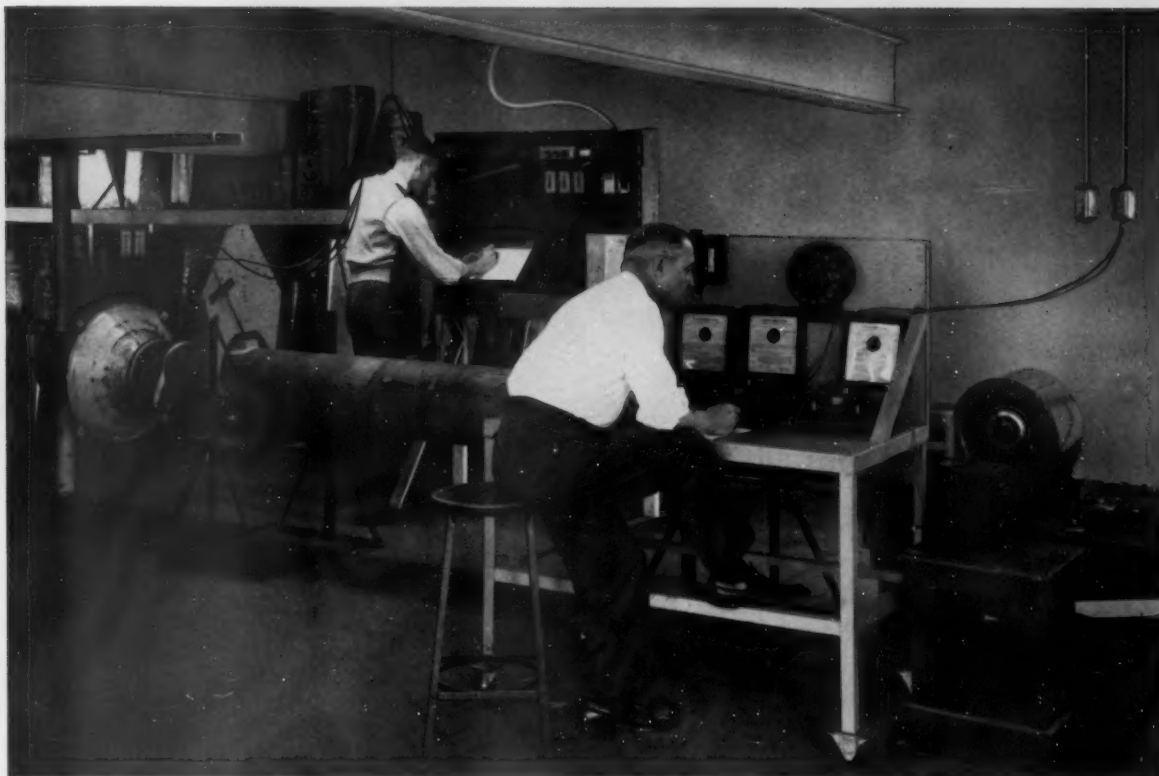
**A. J. HOWETH
CENTRAL HEATING & AIR CONDITIONING CO.
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1000 BRITTAN AVENUE • SAN CARLOS, CALIFORNIA
Manufacturers of Upright, Reverse-Flow and Horizontal Gas Furnaces and Air Conditioners



Circle an area within a 100-mile radius of Houston, and there you'll find Central crews busily producing an annual \$500,000-plus volume in heating and air conditioning. Handling more than 1,000 installations a year in this key Texas market! Sequoia thanks key U. S. Dealer Howeth for his unsolicited praise: "... after installing nearly 6,000 Sequoia furnaces... we have yet to find even the first defective one from the factory!"



An expanded *Brundage* service for engineering departments and manufacturers

The terrific pace of the air conditioning and heating industry is creating formidable work loads for many engineering departments. In some cases, this causes bottle-necks . . . slowing down the marketing of profitable new products.

Brundage can help you solve this problem better than ever before.

Recent expansion has more than doubled Brundage design and testing facilities. This new capacity, combined with 35 years of experience in solving air moving problems, is at your service. If you want to put it to use on any question involving forced air, talk to your Brundage representative or contact Brundage, direct.



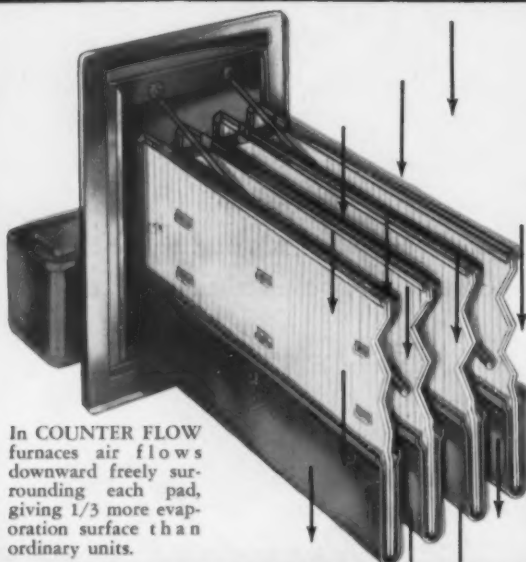
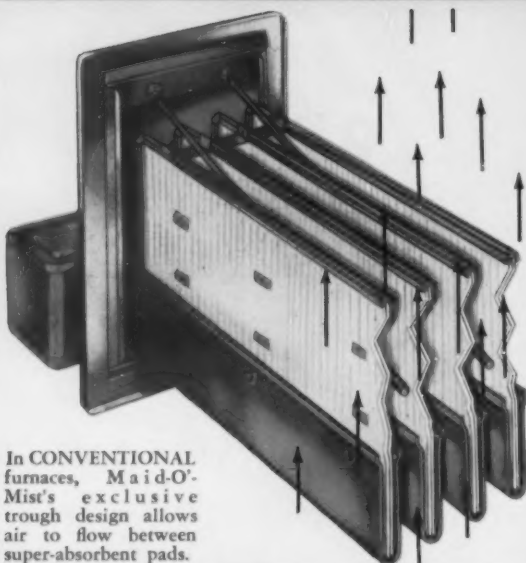
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Saves *half* the time to INSTALL! Gives a *third* MORE EVAPORATION AREA!
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More Humidity per dollar cost

Why More and More Furnace Contractors Are Insisting on the MAID-O'-MIST Humidifier? The reasons are sound. It's a cinch to install, rarely does it require service calls, the cost is small and it gives lasting satisfaction to the customer.

You can see in the picture that MAID-O'-MIST has no flat bottom pan to block the flow of air . . . that its $\frac{3}{8}$ " individual copper troughs are spaced an inch apart to allow unrestricted air-flow between evaporator pads, giving a third more evaporating surface.

Perfect for small plenums, it is quick and easy to install. What's more, it is the *only* standard unit that fits BOTH conventional or counter-flow warm air furnaces.

Use MAID-O'-MIST and you'll agree . . . it's a very remarkable humidifier . . . at a very remarkable price.

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30% MORE EVAPORATION AREA

50% LESS INSTALLATION TIME

AUTOMATIC HUMIDIFIERS WATERLINE CONTROLS
AUTO VENTS . . . HEATING AND AIR CONDITIONING SPECIALTIES

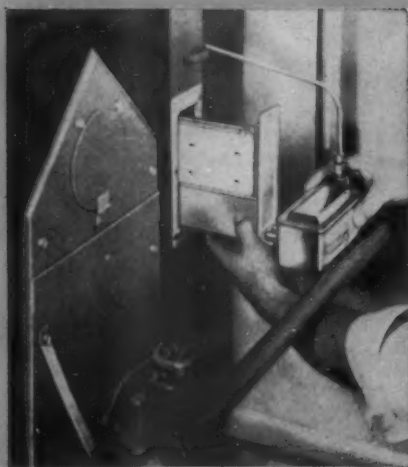
MAID-O'-MIST, Inc.

3217 NORTH PULASKI ROAD • CHICAGO 41, ILLINOIS

The only standard unit
that fits both conven-
tional and counter flow
systems



FOR CONVENTIONAL warm air fur-
naces cut opening in plenum and make
water connections. 9 sizes available
with evaporation capacities of 1 to 10
gals. per day.



FOR COUNTER FLOW, because of its
narrow trough design, you can install
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minimum air passage.



For dependable water level control use **MAID-O'-MIST FLOAT CONTROL VALVES**

Thrifty answer to limited space in
HUMIDIFIERS **AIR CONDITIONERS**
PAN FILLERS **AIR WASHERS**



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FAMOUS No. 50 SERIES

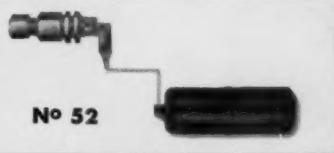
Compact, precision-designed, you can count
on MAID-O'-MIST float control valves to
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advanced engineering, they give faithful
performance.

No. 51 FLOAT CONTROL VALVE

Only 5 $\frac{3}{4}$ " long overall, including copper float 2 $\frac{1}{8}$ "
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brass . . . valve seat of hard nylon, protected with
fine metal screen. Can be fitted in 9/16" hole or
screwed directly into tapped opening. Up to 85 lbs.
pressure; 1 $\frac{1}{2}$ gal. per minute at 50 lb. pressure.

No. 52

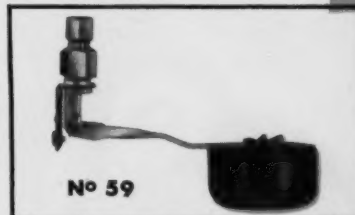
Similar to No. 51, but de-
signed for 1 gal. per min-
ute capacity at 50 lbs. pres-
sure, with pressures to 125
lbs. Overall length, 8",
with 1 $\frac{1}{2}$ " x 4 $\frac{1}{8}$ " long float.



No. 52

No. 59

Valve is vertically mounted
with special bracket to
mount on reservoir or pan
well above water line. Just
5" long.



No. 59

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Series Diaphragm Valves

Heavy duty, large capacity
water level controls, rug-
ged and strong. Capacities
1 $\frac{1}{4}$ gal. to 6 gal. per min-
ute.



No. 6917

Get full information from your jobber or write for catalog today!



MAID-O'-MIST, Inc.

3217 NORTH PULASKI ROAD • CHICAGO 41, ILL.

Good Management Avoids Over-Expansion

(Continued from page 100)

ment will be forthcoming. Even in small localities such checking can be done through the local bank if a credit bureau is not available. It is well worth the cost.

Don't Overbuy

How about overbuying? Are you ever tempted? Excessive inventories are a real problem in many lines of businesses but perhaps we can truthfully say that it is more of a minor problem in our particular industry,



at least for small dealers. Unit prices are relatively large as compared to the amount of working capital available in most instances and this tends to put most small accounts on a rather hand-to-mouth basis. Although we all know that you "can't do business from an empty wagon," it is a temptation to some men to overbuy, and the main thing to remember is that it ties up many dollars of precious working capital when they may be more urgently needed for operating expenses. Bear in mind that inventories can become obsolescent, damaged, stolen, and they can drop in value. Your inventory represents a vital and important asset and deserves more thought than is usually given to it. There is an old rule which still holds pretty much true that the inventory at no time should exceed the amount of working capital.

Recently, a customer came into the office to discuss his financial statement. His total sales volume runs

around \$150,000 a year. We were not far into the discussion before he asked, "What do you mean by working capital?" For the benefit of those dealers who may likewise not know its meaning, let's explain it. Very simply, working capital is the difference between the amount of your current assets and your current debt. Current assets are those which should turn over quickly or at least within a year. In a small business they are roughly confined to cash, accounts receivable and inventory. Current debt is the indebtedness which you owe and which must be paid quickly, or at least within a year. Thus, in a small business it usually consists of the accounts payable, bank indebtedness and all the various accrued operating expenses such as payroll and rent, which must be paid from week to week or from month to month. The difference between the total of these current assets and current debt is your working capital — the grease which either does or does not allow your business to run smoothly depending on the amount you have.

Over-Expansion Dangerous

And thinking of working capital naturally leads to the thought of another pitfall into which many a small business man has fallen. That is the desire to over-expand. It is human nature to be proud of bigger and better possessions, but oftentimes this pride goes before a downfall.

This is a step which should be well thought out before it is made. Will sales volume increase sufficiently in this new location to absorb the heavily increased overhead and still show an increase in profit?

Finance Building Wisely

Another falacy which pops up frequently is the dealer's belief that he can build a new building mostly by himself so that "it won't cost me

much." And so he goes merrily on using his own men, buying much of the material himself and building a good portion of the new structure, only to find out after it is completed that his working capital is sadly depleted. It has gone for payroll, materials, etc. If this expansion step is justified and is undertaken, by all means the new building should be properly financed in the usual way which means regular mortgage financing from a bank or some other finance company. If your working capital is small and only barely sufficient to run your present business, do not sink any portion of it into a fixed asset of this nature.

It's a grand feeling when orders start to come in fast, business booms, more inventory is purchased and more men are added to the payroll. Again, however, that problem of working capital is very important. Unless it is sufficient and keeps pace with the increased sales volume, you are "overtrading."

Overtrading Brings Accidents

Overtrading is like driving a car too fast. Both car and driver may be in good condition but at excessive speed the slightest obstacle or miscalculation may cause a serious accident. For example, a sudden large sale (perhaps a housing project) naturally results in much heavier buying which in turn results in heavy accounts payable. Men are added to the payroll, more space is needed which increases rental and maintenance; insurance, compensation, trucking, and in fact, almost all operating expenses increase sharply. It is true that receivables also increase but that poor little amount of working capital doesn't, because of the heavier debt. When such a condition comes suddenly, or even rather quickly, the internal strain becomes terrific and that "accident" may, and oftentimes does, happen. Why? Because all the purposes and

(Continued on page 111)



why be
**short-
 changed**
 by 'under-par'
 air-conditioning?
 ...make your business and profits grow
 with quality **JANITROL** cooling!

Only Janitrol gives you both 'add on' and year 'round conditioners with the fabulous new PRIDE O' YARD air-cooled compressor-condenser unit, styled and powered to build your profits and your prestige! It's low, sleek, beautiful—completely outmodes all other units of its type in appearance, performance and freedom from service call-backs! No wonder Janitrol dealers can count on a lion's share of the business!

The excellence of design and construction that distinguishes all models in the complete Janitrol line assures easy installation, foolproof performance, complete satisfaction after the sale. And making the sale is easier, too, because your prospects know the Janitrol name plate guarantees top quality and value.

There are Janitrol 'packaged' conditioners for waterless or water-cooled operation in every residential and light-commercial application. Models for use with existing warm air systems, and for independent operation. Combination cooling-heating units to feature for year 'round comfort. And Janitrol backs you up with powerful merchandising and advertising support, spearheaded by sales-making ads like these in magazines that reach your best homeowner and builder prospects!



Ask your Janitrol representative for the profit-making story on Janitrol's complete air conditioning line *right away!*

*...the best years of your business
 begin with...*

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 HEATING . . . COOLING



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Complete line of gas and oil furnaces, unit heaters, conversion burners, water-cooled and air-cooled summer conditioners, combination heating-cooling conditioners.

CASH-IN with the powerful
 sales appeal of new
'Janitrol' 'ADD-ON'
WATERLESS COOLING



Compare! On every count—performance, beauty, installation ease—there's more for

your customers, more for you with new **JANITROL ADD-ON COOLING!** Beautiful PRIDE O' YARD air cooled compressor-condenser unit adds sparkling beauty to any yard, obsoletes ordinary units designed with no thought for appearance. Quiet, powerful! Compressor motor and condenser especially designed for air cooled operation. Easily teamed with most any warm air system . . . evaporator coil goes in duct, PRIDE O' YARD unit outside. No usable indoor space needed! 2, 3 and 5 H.P. sizes.

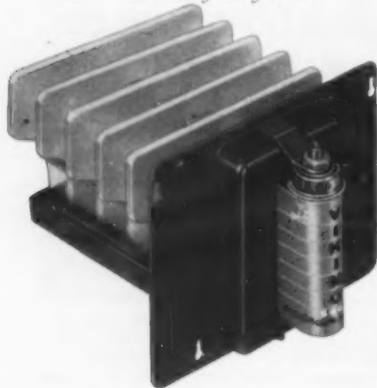


BLOWERS, FANS AND HUMIDIFIERS— DESIGNED FOR *Dealer* PROFIT



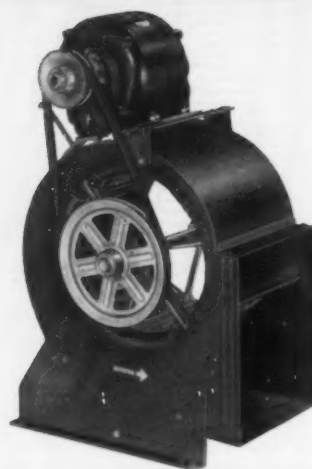
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Modernization
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PACKAGES**

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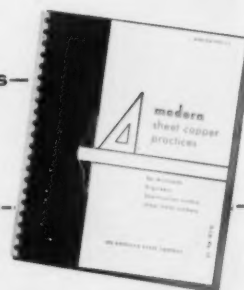
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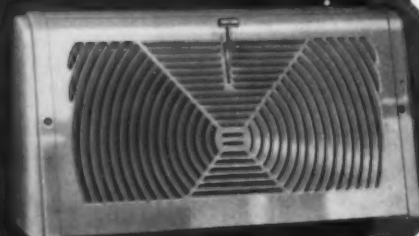


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ITS LOW RESISTANCE PERMITS TOP-NOTCH RESULTS AT LOW VELOCITY. It provides the same air pattern as our popular No. 401 Sidewall Diffusaire, thoroughly blanketing the average wall or window area.

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PROJECTION IS ONLY 2 3/4". FURNISHED IN OUR HIGHLY ATTRACTIVE DECORATOR GRAY OR METALUSTRE FINISHES.

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Offer Financing to Build Sales Volume

(Continued from page 106)

needs for which that working capital is used are now suddenly increased and multiplied many fold.

Perhaps if the receivables turn over very quickly and promptly and in full, and if nothing whatsoever interrupts this tight schedule, and if the suppliers are lenient, the storm may be weathered. However, if sales take a sudden drop, or incoming merchandise is delayed, or receivables slow up, or perhaps the weather is bad so new house installations drag, then the storm gathers fast.

Good financial management doesn't deliberately overtrade, nor does it turn aside from an increased volume of sales. What it does is provide for the increased working capital needs. To answer this need is the primary function of any bank. Perhaps a straight unsecured, short term working capital loan cannot be obtained and if not there are other ways — assignment of contracts, financing of receivables, mortgaging of fixed assets, or possibly even borrowing funds from friends or relatives. One rule is basic, however, and that is working capital must increase with sales volume.

An added burden on working capital today and one which will become increasingly apparent is the modern trend toward summer cooling. It is definitely coming more and more to be regarded as a necessity and not a luxury for the few. The old time furnace and sheet metal man must now be equipped to handle this comparatively new type of equipment, if he is to keep pace with his competition. Because it is generally higher priced merchandise it will result in the need for still more working capital in the average business.

Is Insurance Adequate?

Is your insurance coverage adequate? Proper and complete coverage is an absolute necessity but it can also be a costly and wasteful use of money unless it is carefully

WATCH OUT FOR THESE DANGER SIGNALS

Heavy and slow accounts receivables

Excessive inventory

Inadequate sales

Heavy operating expense

Heavy personal withdrawals

Heavy debt

Excessive fixed assets

Lack of working capital

Inadequate insurance

Too much time spent on outside interests

planned. By all means, seek the advice and experience of one who is qualified in the insurance business.

Many times we have seen a good small dealer hurt himself considerably by branching out to include some other line, sometimes allied, sometimes not. This was especially true right after the war when appliances were so alluring. Again, it is the old story, the added strain on working capital and in such cases another factor, lack of experience in the new type of business, which can prove too much of a handicap.

No Business Without Sales

Finally, there is one more big and important pitfall for small business, one that has caused as much trouble and failure as any of the factors mentioned above. Here we digress a bit from the strictly financial aspect of small business, but it is so important it must be mentioned. We refer to lack of sales volume. It is like winding the clock or putting the plug into the electrical outlet; until sales start, nothing happens.

There is, however, one small tangent to this subject with which we are familiar and which should be mentioned. Recently a convention of independent hardware retailers was told that they were "20 years late" in their approach to budget selling. If that is true of hardware stores it

also can apply to some heating-cooling dealers. We refer of course to selling old house work on FHA terms or on some similar locally sponsored bank or finance company plan.

Many dealers unintentionally grant the equivalent of installment terms to their customers without any return or advantage to themselves. These are the dealers who sell on "cash terms" and then have to wait for their money for weeks or even months. These are the dealers who have to make a series of collection calls before the money is available. These are the dealers who penalize themselves by investing their own working capital in accounts receivable and their own time in collection effort.

See Your Banker

By all means, hook up with some local bank or some finance company so that you can offer deferred pay-



ments. Then use it for all it is worth.

It is fun to own and operate a small business if it has good health. The converse is equally true. Sometimes a major disaster, such as flood, hurricane, etc., which could not be foretold, strikes a business. Most often, however, there are symptoms or causes which give warning and which if recognized, may be corrected to avert the major illness. If you have good records (another necessity) they will show up.

Keep your business "body" healthy and your business "face" clean — fair value for a fair price. Then you will enjoy living. If illness does come don't be too proud to seek advice and help.

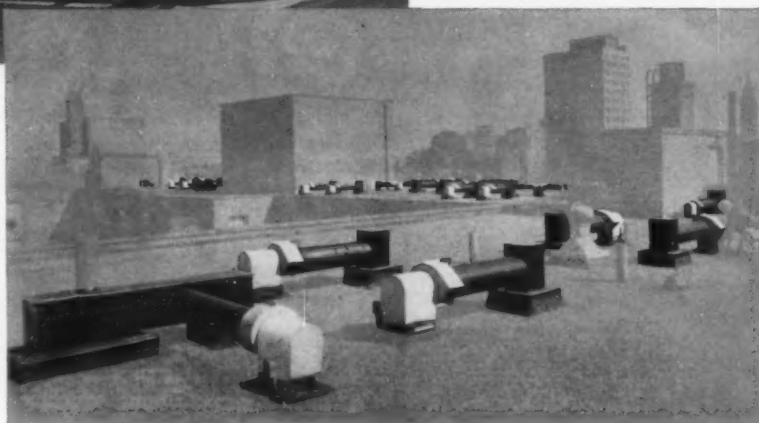
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Peerless Blowers Solve All Types of Ventilation Problems



AT left is a large Peerless Backward Curve Blower installed on the roof of one of the nation's largest automobile body plants. Its job is to draw air from the ceiling of the press room and discharge it, for ventilation purposes, into the press pit which is below ground level.

AT right is a grouping of 39 small Centrifugal Exhaust Blowers on the roof of a 14-story, 299-unit apartment building. They handle about 30,000 cubic feet per minute exhausting odors and stale air from kitchens and bathrooms in the apartments below.



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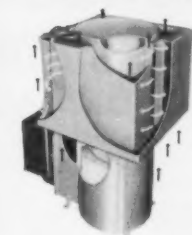
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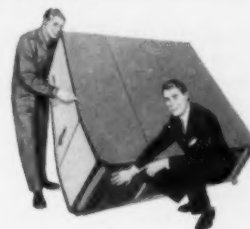
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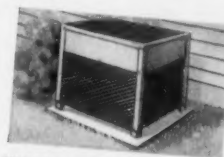
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How Sub-Contractor Gets Payment for Material

Court rules in favor of sub-contractor for payment of materials put into a job when the general contractor fails to meet the requirements

ONE MORE STATE has asserted the right of a materialman to compel payment by a surety for equipment used in the construction of a building.

In its definition of "materialmen," an Ohio court said: "Whether materials furnished by a dealer to be used in the erection of a building were selected from the stock of the dealer or made by him in his own establishment or procured from another for that particular purpose, such dealer is a materialman." (Editor's note: in this case the term "materialman" is what is sometimes known as a sub-contractor.)

In this instance the payment bond contained the following conditions: "If the principal shall promptly make payment to all persons supplying labor and material in the prosecution of the work provided for in said contract and any and all duly authorized modifications of said contract that may hereafter be made, then this obligation to be void, otherwise to remain in force and effect."

Suit was brought by a materialman against the surety on these bonds for material supplied a sub-contractor. A lower court held that as the materialman had not been named in the bonds nor given the right to sue the surety, he could not recover. From that decision the materialman appealed. In its reversal the appellate court said:

"We find no condition in the bond presently sued on except the pay-

ment of materialmen and laborers. We have no doubt that the bond was obtained by a general contractor primarily for its own protection, but we think that this supplies the motive in securing the undertaking rather than the intent as to who shall be benefited."

Of the grounds on which a materialman not a party to the surety contract may recover from a surety, the court added:

Bond Increases Protection

"It would seem therefore that the purpose of the payment bond between the subcontractor and the general contractor would involve more than identifying the latter as to the risks of mechanics' liens and related litigation. It was designated to assure the general contractor that the materialmen and laborers would in fact be paid by the principal or surety. Such payment would be in the direct interest of and inure to the benefit of the general contractor.

"The condition therefore would evidence an intent to benefit the parties referred to. If this were not the purpose of the bond, then it would seem to be limited merely to securing the general contractor against legal expenses which it might incur in removing invalid liens. It is reasonable to infer that the object of the payment bond was to secure some protection not afforded by the performance bond."

In an appeal by the surety from

this decision, the highest court of the state also discussed the right of a materialman in this instance to recover under a payment bond.

"A materialman is allowed to sue as a third party beneficiary when the primary purpose of the bond and also its paramount purpose is to benefit creditors," the court stated. "The language of the within bond specifically provides that the materials furnished are to be 'free of lien of any third party.' When this is read in conjunction with the underlying contract the inference is irresistible that the parties intended to benefit unpaid materialmen."

In another and earlier case involving similar circumstances, a Pennsylvania court considered the right of a materialman to look to the surety for payment.

Promise Must Be Held

"It is no longer an open question whether a materialman has a direct right of action on a construction bond if the bond insures to his benefit," the Pennsylvania court said. "In the case of a surety bond for the payment of money, if there is a promise to pay money to an ascertainable person the fact that he is a third person who gave no consideration for the promise does not prevent him from enforcing it.

"The words used in building contracts and in accompanying bonds are now usually such that they are and should be interpreted as a promise by the surety to pay laborers and materialmen in case of default by the contractor. In this class of cases it is sound policy to interpret the words liberally in favor of the third parties."

[Note: While this discussion applies to actual cases, it should be remembered that legal rules vary in different states.]

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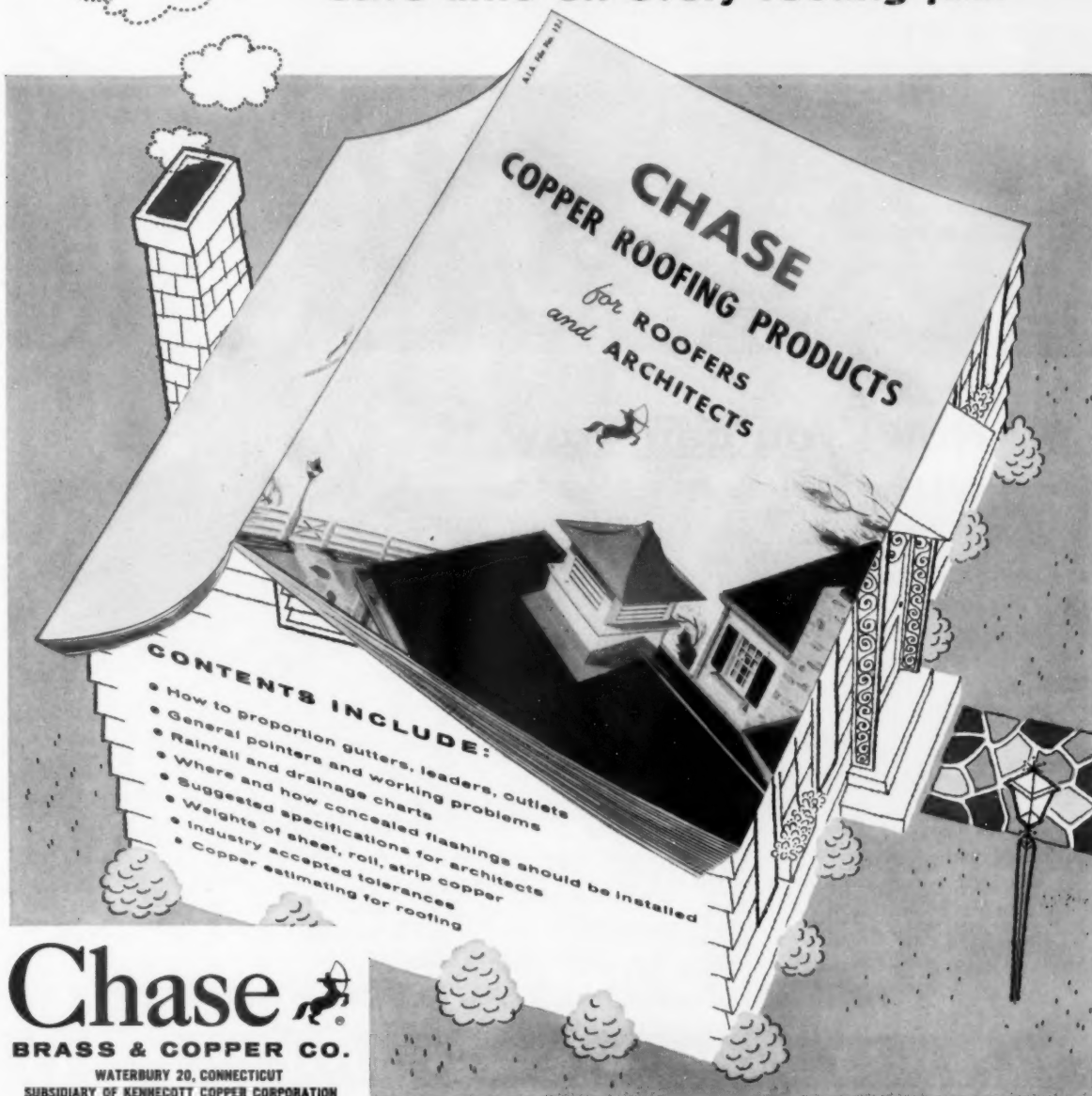
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**This 50-page book can help you
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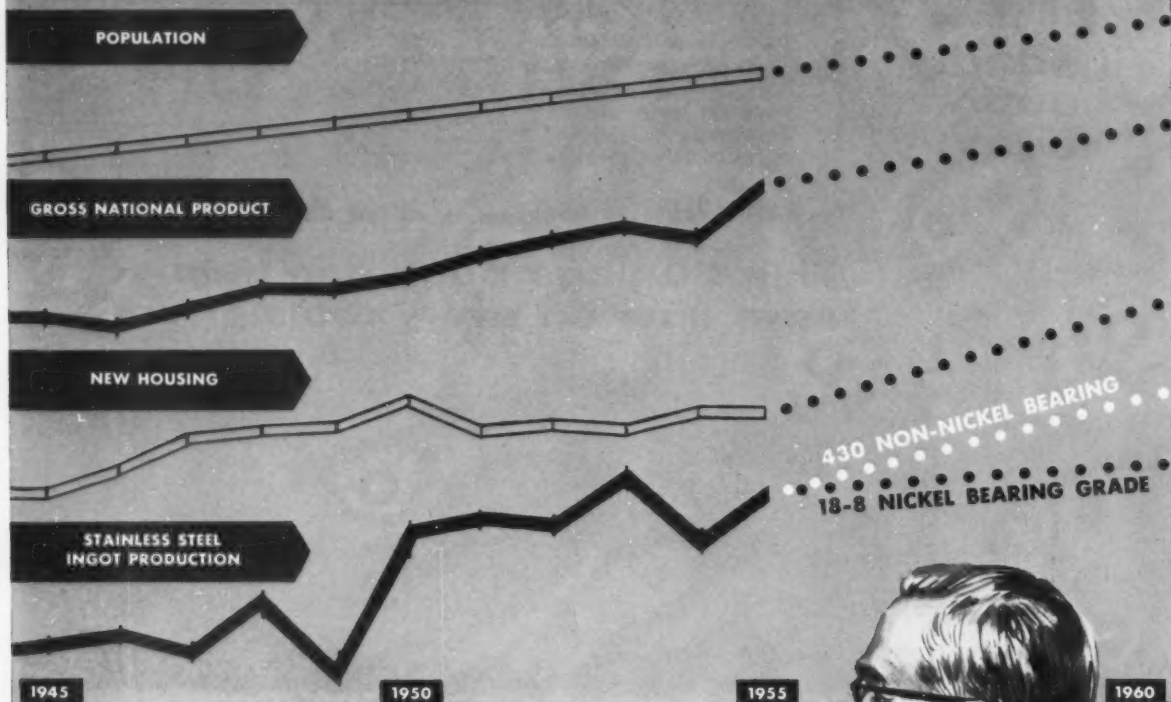
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Now! you can grow with your markets

... because Washington Steel Corporation has taken two big steps forward:

1. Making available an adequate and dependable source of supply for Type 430 stainless steel.
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No. 2000 BASE PERIMETER INTAKE

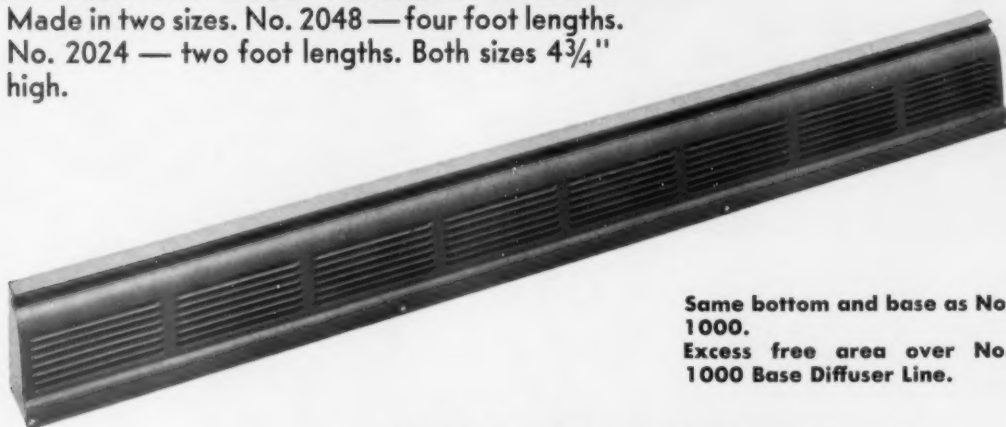
The NEW RUNNING MATE for the No. 1000 U. S. Base Diffuser. It MATCHES IN DESIGN. It "INHALES" the Return Air — IT'S NON-VISION — IT'S EASY TO PAINT — Easy to Wipe and Keep Clean.

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Sales Pace-Setter among "Strip-Base" Diffusers because it sets the pace in Heating and Labor-Saving Features. Slide-Plate boot opening Saves Floor Cutting Expense. Set-Lock Balancing damper saves one man's installing time.



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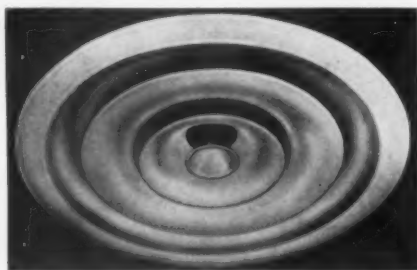
SOLD BY LEADING JOBBERS FROM COAST TO COAST

EQUIPMENT DEVELOPMENTS

The latest information on manufacturers' developments is presented here with brief summaries of the applications of these products. For additional product information which is available, see this month's New Literature department

Ceiling Diffusers

LINE OF ceiling diffusers with contour cone design said to improve air diffusion for heating, ventilating and cooling—*Titus Mfg. Corp., Dept. AA, Box 810, Highway 20 West, Waterloo, Ia.* Turning the small



center cone produces any air pattern desired from directly downward to full horizontal without changing the relative positions of the three center cones, according to the manufacturer. All diffusers have four cones.

Hand Metal Notcher

NO. 100 HAND metal notcher with capacity to cut a 90 deg notch $4\frac{1}{4}$ in. deep in 16 ga mild steel—*Whitney Metal Tool Co., Dept. AA, 91 Forbes St., Rockford,*



Ill. Blade is 6 in. long on each side. Unit is operated by hand lever and eccentric-pivoted link which delivers cutting power to blade through a V-ram with adjustable ways which are said to insure positive blade and die alignment. Aviation type bearings are designed to reduce friction. Machine is mounted on steel table $21\frac{1}{4}$ in. wide, $12\frac{1}{2}$ in. deep with $2\frac{1}{2}$ in. high legs containing bolt holes for bench mounting. Unit will also perform various cutout or cutoff opera-

tions on corners. Guides with 90 and 45 deg sides are adjustable close to both cutting edges.

Oil Burner Stack Switch

OIL BURNER stack control for continuous or intermittent ignition service—*Penn Controls, Inc., Dept. AA, Goshen, Ind.* Featured is low voltage protection in addition to automatic recycling with timed purge period. Intermittent ignition control recycles automat-



ically on flame failure or power interruption during "burner on" cycles; two to three minute scavenger period allows fumes to vacate combustion chamber to assure safe start. Continuous ignition control recycles only when power is interrupted. Stack switch is said to assure positive ignition safety; if flame is not established on burner start, control acts to prevent collection of unburned oil in combustion chamber by shutting burner down, the company reports.

Water Cooled Conditioner

FIVE TON water cooled summer air conditioning unit with remote application of condensing unit—*Armstrong Furnace Co., Dept. AA, 851 W. Third Ave., Columbus 8.* Condenser can be used with 5 ton air cooled evaporators or two 3 or 2 ton evaporators, the manufacturer states. Condensing unit can be installed near the evaporator or adjacent to the cooling tower; vibration eliminators are provided on spring-mounted compressor. Five ton water cooled condenser is tube-in-tube type designed for chemical cleaning and lower pressure drop due to decreased restriction to liquid flow. Twelve pounds of refrigerant are used. Control panel in condensing unit consists of main contactor with poles for tower pump, high and low pressure cut-outs and a panel board. Auxiliary control panel con-



FIELD TESTS PROVE IT...

You'll make more furnace sales—faster—with this new Rheem Sales Album

HERE'S WHY: *First*, it's a clear-cut, logical selling story on Rheem's complete line of gas and oil furnaces and complete home air conditioning. It's written the way you want it—because heating contractors, just like yourself, helped write it.

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Third, it's a non-technical presentation that's easily understood. Because the purchase of a new furnace is usually a joint decision by husband and wife, it's written to hold the interest and attention of both. It helps the lady of the house understand how important a good furnace is.

WE KNOW IT WILL WORK FOR YOU! Field tests have proved it! Heating contractors using the Rheem book have not only shown more actual orders—but orders for more profitable heating and air-conditioning jobs! It can do the same for you.

This "silent salesman" can't become outdated. As new material is developed, dealers will be supplied with new sets of pages.

Put it to work for you. It covers Rheem's complete line of Highboy, Lowboy, Forced Air, Counterflow and Gravity type furnaces. There's a Rheem model and size to fit every requirement. See your Rheem wholesaler now, and get a head-start on bigger sales, and better sales with this great new Rheem Sales Album.

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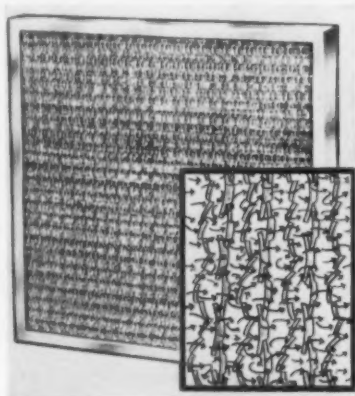
equipment developments

(Continued)

tains low voltage transformer, switching relay for evaporator fans and line voltage and low voltage terminal strips. Units are available for 230-v single phase and 208 to 220-v three phase.

Thin Aluminum Filter

ONE INCH thick all-aluminum filter designed to catch and hold lint and dust in quantities equal to the capacities of 2 in. filters without increased resistance to air flow—*George Evans Corp., Dept. AA, 121 37th St., Moline, Ill.* Filter pack has larger openings on in-



let side, progressing to smaller orifices on outlet side and forcing air into extremely high turbulence—forcing it to travel 3.5 times the filter depth from inlet to outlet side. Rough talonlike edges grip and hold the dirt and absorb large quantities of lint without checking off the air stream, the company states. All metal parts are stamped from aluminum. Cleaning is accomplished by flushing with tap water. Filters are in all standard sizes.

Notching Machine

PUNCH PRESS with adjustable automatic feed, designed for punching various shapes along the edge of sheet metal, as well as for variable spacing, depth and patterns—*Consolidated Marketing Corp., Dept. AA, 1017 Packard Bldg., Philadelphia 2.* Unit handles flat and circular stock and is said to be especially suited for notching dovetail or clinch collars for heating, ventilating and cooling systems as well as for making curved metal letters and similar operations. Notcher is mounted on stand; cutting level is 3 in. from floor. Unit is operated by $\frac{1}{4}$ hp motor; automatic feed puts material through at speeds up to 18 fpm. Sheets up to 21 gage can be handled. Adjustment decreases or increases spacing up to $\frac{7}{8}$ in. centers; another adjustment reduces notch depth from maximum of $\frac{3}{4}$ in.

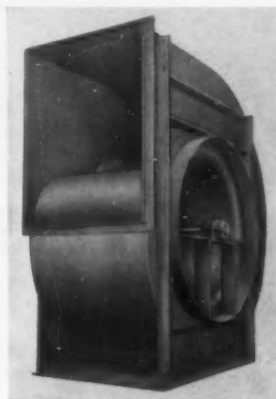
Dies make approximately 15 deg notch. Unit is 18 in. wide, 12 in. deep, 50 in. high according to the company.

Slotted Air Diffuser

SLOTTED AIR diffusers for interiors requiring linear type of outlet—*Connor Engineering Corp., Dept. AA, Shelter Rock Lane, Danbury, Conn.* Adjustable grid type damper is said to regulate air volume evenly over entire diffuser length. Model KSL-1 is for single air stream discharge in $3\frac{1}{2}$ and 6 in. widths; KSL-2 is for multi-directional discharge and greater capacity in 12 in. width. Both are in 2, 3, 4 and 6 ft models. Several units can be installed end to end by omitting end flanges at each joint. Capacity is 50 to 300 cfm per ft of length.

Centrifugal Blowers

SERIES 6000 "Silentvane" centrifugal fans with blades redesigned to improve mechanical and static efficiency under high pressure air handling as well as to decrease noise—*Sturtevant Div., Westinghouse Electric*



Corp., Dept. AA, 105 Readville St., Hyde Park, Boston 36. Inlet vane control is available, operated manually or automatically for applications requiring regulation of air output over wide range of operating conditions. Sixteen models have wheel diameters from 27 to 108 in.

Water Processing Unit

WATER CONDITIONING device made of specially processed metal which produces a catalytic effect on water to prevent and remove scale, eliminate harshness, and minimize scum, rust stains and corrosion—*Eviss Mfg. Co., Dept. AA, 40 Boardman Pl., San Francisco 3.* Unit is in processed cast iron, bronze and aluminum. Water which passes through the unit is affected in certain physical properties which are said to result in control of scale, etc. Lime particles in water are forced to join into tight flocs or granules which do not



PROVED PROMOTIONAL PACKAGE includes direct mail, radio and TV spots, signs, billboards, local newspaper ads, proposal presentations, special mailings, customer incentive programs, training films plus scores of miscellaneous sales and merchandising aids, all supported by a powerful national ad campaign.

"TEST CITY" promotion helps
Walt Stevenson



up profit **40%** in one year!

It's the same proved sales package
available to all **Mueller Climatrol** dealers

HOW much should you spend for sales promotion? How big a boost in volume can you expect from a well-planned program? Here's what happened when Walt Stevenson of Hoosier Heating & Sheet Metal Co. in Terre Haute, Indiana, cooperating in a unique "test city" project, set out after the answers.

Fully exploiting Mueller Climatrol's sales promotion, Stevenson nearly doubled his respectable 1954 volume in 1955. More important, by following a planned program, he increased his *net* profits a full 40%.

Promotional backing is just one of many Mueller Climatrol measures supporting its dealers. Factory backing, engineering training, prompt shipments — all help make your selling job easier... make the "long green line" the most profitable.

We think you'll be interested in the results of this project and the lessons taught by it. Write for a reprint of Mueller's "Test City" story.

Mueller Climatrol

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... sales are turning greener every day



**QUALITY
MAKES IT CLICK**
America's most complete heating and cooling equipment line includes remote waterless condensing units (left). Like many Mueller Climatrol packaged units, year-round air conditioner at right is available less high side for waterless cooling.



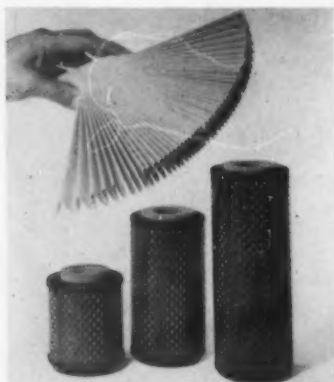
equipment developments

(Continued)

form scale, the company reports. Unit is an oversized coupling which fits into water systems.

Fuel Oil Filter

THREE MICRONIC filter elements said to remove particles as small as 0.0005 in. from fuel oil—*Purolator Products, Inc., Dept. AA, 970 New Brunswick Ave.,*



Rahway, N. J. Units are said to filter over 100 gph; they are made of resin-impregnated cellulose which

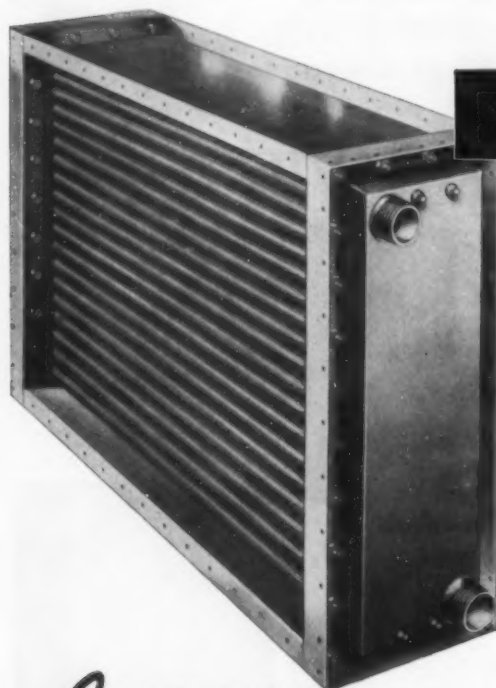
will not shrink, distort, stretch, flake or deteriorate, according to the manufacturer. Elements are water and acid resistant.

Braking Machines

REDESIGNED "Plain," "Universal" and "Combination" brake series for bending and shaping sheet metal—*Barth Engineering & Mfg. Co., Dept. AA, Milldale, Conn.* "Plain" series is for general use in duct work, tanks, skylights, signs, roofing, etc. Units are in 4, 6, 8, and 10 ft sizes. "Universal" models have same action and scope as standard models, plus variable length of bending edge to accommodate different sized boxes, cabinets, etc. Finger extension is 6 in.; standard finger widths are 3, 4 and 5 in. Units are in 4, 6 and 8 ft. sizes. "Combination" series consists of lighter gage machines adaptable to same work as other two series, especially for duct and fitting work. Finger extension is 4 in.; units are in 3 and 4 ft. sizes. Bench brake is designed for small job shops and has capacity rating for $\frac{3}{8}$ in. flange on mild steel. Units are in 3 and 4 ft sizes.

Room Cooling Unit

THREE AND 5 ton capacity room cooling units which can be installed as window units or against outside walls—*General Air Conditioning Corp., Dept. AA,*



AEROFIN

Heat-Transfer Surface

- High Efficiency
- Long Service Life
- Low Maintenance Costs

You are assured of high efficiency in heating or cooling — long service life — low maintenance and service costs, when you specify Aerofin extended-surface heat exchangers.

The reason is obvious: Aerofin makes heat exchangers *exclusively* — offers you the results of unequalled experience, unequalled production facilities, unequalled materials testing and design research — and the guidance of a complete, highly skilled engineering staff, at the plant and in the field.

For the most practical solution to your heat-exchange problem, ASK THE AEROFIN MAN.

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3
FACTUAL
reasons
why
Curtis
dealers
can make more money—
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1

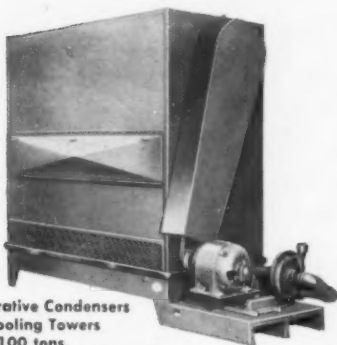
CURTIS has 102 years of experience in manufacturing precision made equipment. One of the first manufacturers of packaged air conditioning units—since 1936.

2

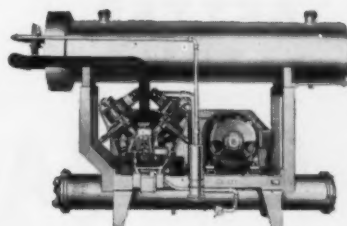
Unsurpassed know-how for building air conditioning units that operate longer with less maintenance and service—YET ARE COMPETITIVELY PRICED with generous profit margin for you.

3

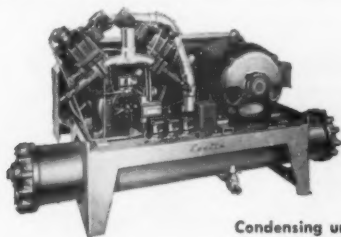
CURTIS provides sales and promotional aids—a complete financing plan—and a national advertising campaign to make your selling easier.



Evaporative Condensers and Cooling Towers up to 100 tons. Air handling units to match.



Packaged Liquid Chillers— $7\frac{1}{2}$ to 100 tons—F-12 or F-22. With room console units to provide controlled cooling and heating without duct work.



Condensing units up to 100 tons—F-12 or F-22.



Packaged units in a rainbow of colors—a CURTIS exclusive. 3 through 50 tons.



Packaged Air Cooled Air Conditioning Units—2 through $7\frac{1}{2}$ tons. Residential and Commercial applications.

Remember
YOU CAN COUNT ON

Curtis

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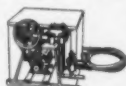
INDUSTRIAL AIR COMPRESSORS



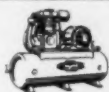
AUTO LIFTS



AIR CYLINDERS



CAR WASHERS



AUTOMOTIVE AIR COMPRESSORS



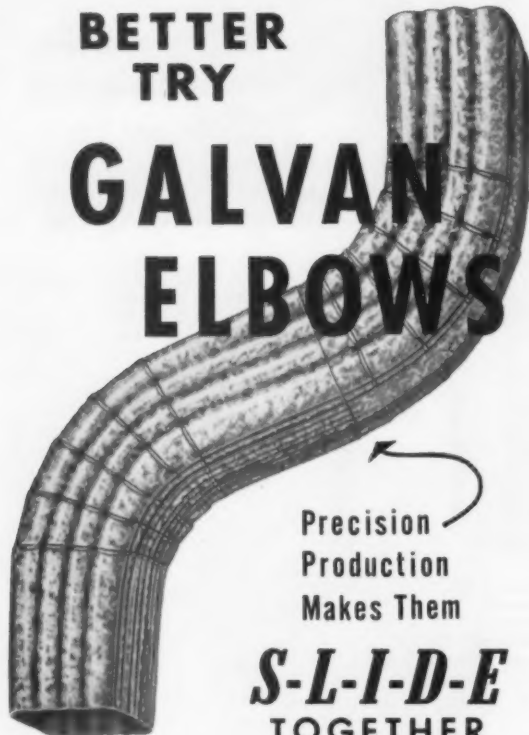
CM-11



**Got
Yourself
In A
Lather?**

**BETTER
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Precision
Production
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TOGETHER**

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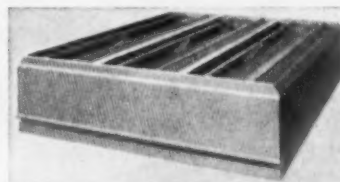
equipment developments

(Continued)

4542 E. Dunham St., Los Angeles 23. Units are packaged, charged and wired at factory, are thermostat controlled and operate on a standard outlet. Units operate with 3 and 5 hp compressors, are said to produce 37,700 and 65,500 Btu, 1400 cfm and 1800 to 2400 cfm at 0.3 static pressure, respectively.

Low Contour Roof Ventilator

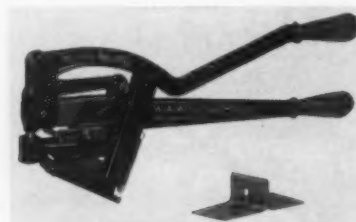
"CONTOURAMIC AIRMOVER" low contour gravity flow roof ventilator—Swartwout Co., Dept. AA, 18511 Euclid Ave., Cleveland 12, O. Unit is 21½ in. above roof curb; air moving capacity is 7 percent greater



than previous models. Redesigned damper control has fusible links which permit weighted dampers to open automatically in case of fire; links melt at 160 F. Drainage runs directly to roof on both sides. Base is designed for mounting on concrete, steel or wood curb. Units may be installed singly or in continuous runs.

Clip Punch

No. 8C CLIP PUNCH which forms clips to fasten sheet metal seams for duct work without hammering—Whitney Mfg. Co., 636 Race St., Dept. AA, Rockford, Ill.



Tool weighs 8 lb; overall length is 18½ in. Capacity of the clip punch is three thicknesses of 20 ga steel, according to the manufacturer. Only one operation is required for fastening.

Axial Flow Fans

AXIAL FLOW fans with wide blades to provide constant air flow over entire working surface of wheel—Detroit Blower Corp., Dept. AA, 9867 Pacific Ave., Franklin Park, Ill. Fans are designed to eliminate back flow with hub-tip ratios that enable larger blade angles near the hub to produce pressure equal to that against which unit as a whole is working; blade angles

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pre-fabricated

WILLIAMSON

DUCT, PIPE & FITTINGS

for any cooling or heating system



The Time-Wasting Way



The WILLIAMSON Way

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TODAY!**

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Whatever type home installation you are making, you can increase your profits by using WILLIAMSON pre-fabricated duct, pipe and fittings. It's the most comprehensive line offered . . . designed to make your jobs faster and easier, yet maintaining the high tailor-made standards you have established. WILLIAMSON, *first* in the industry with a combined line . . . for both cooling and heating . . . assures you the most modern duct, pipe and fittings available. Check the numerous WILLIAMSON advantages . . . then act today for pre-fabricated profits!

Compare . . .

SIMPLIFIED DESIGNING AND ORDERING—Every system part numbered for quick identification. Factory forms and sample plans for guidance.

SPEED SHIPPING, CUT UNLOAD AND LOAD TIME—Everything you need from *one* source Com-packed for individual job. No loose fittings. Easy identification.

SAVE WAREHOUSE SPACE AND INVENTORY TIME—Cartons standard size for simple stacking. Marked at factory for identification without opening.

PROTECT FROM DIRT, DAMAGE AND DISTORTION—No loose fittings. Sturdy cartons keep all parts in shape . . . in transit or in warehouse. Perfect fit assured.

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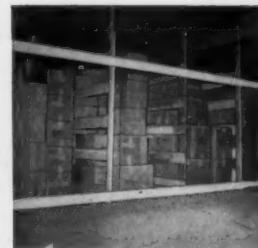
PERMIT FASTER, EASIER INSTALLATION—Inexperienced men can do basic layout. Experienced craftsmen finish job. Save as much as 8 hours on average job.

ACCURATE COST ESTIMATE, ASSURED PROFIT—Insure healthy profit margin. Know costs *before* you bid. No chance for losses during installation.

STREAMLINED TAILOR-MADE SMOOTH LOOK—With *your* final touch, match the finest tailor-made jobs. Parts engineered for low friction, perfect fit.



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The WILLIAMSON Way



More profits from less time and less cash is just what I need. Rush me information on PRE-FABRICATED PIPE & FITTINGS PROFITS today.

- ☐ Send me FREE Pipe and Fittings Catalog
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THE WILLIAMSON CO., 3310C-7 Madison Rd., Cincinnati 9, Ohio

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City _____ Zone _____ State _____

equipment developments (Continued)

decrease to small values at the tip, according to the company. Wheels are welded steel, are available with four, six and eight blades. Units are in belt driven and direct motor powered models. Fan diameters run from 12 to 72 in. with air moving capacities from 1200 to 100,000 cfm.



Air Cooled Units

MODELS 30 RAC, 40 RAC and 50 RAC air cooled cooling units which have 25,800, 39,200 and 49,650 Btuh capacities, respectively—Payne Div., Carrier Corp., Dept. AA, 700 Royal Oaks Dr., Monrovia, Calif. Each model is available with vertical air flow

coil, horizontal air flow coil or fan coil. Fan coil is designed for uses independent of existing forced air systems. Inverted V type cooling coil exposes more coil surface to circulated air, the company points out. Coil casing fits into ductwork.

Glass-Reinforced Dip Tube

DIP TUBE designed to overcome collapse, telescoping or deforming and to prevent discoloration, odor or taste in water, now incorporated into domestic water heater line—Permaglas Div., A. O. Smith Corp., Dept.



AA, Kankakee, Ill. Dip tube is now used in all of the company's gas water heaters. Glass-reinforced unit carries incoming cold water to lower part of tank, is not affected by water temperatures, the company reports. Tubes are said to have more than two-thirds glass content.

GF CARTRIDGES FIT ALL LEADING FILTER MAKES

THE ORIGINAL WOOL FELT "STEP-BACK" DESIGN

FAMOUS FOR FINER FILTRATION

Available in several convenient sizes covering all leading makes of filters

DOUBLE UP Summer Service PROFITS!

Before the fall season begins, install a genuine GF cartridge in every filter you service. During the same call, install a GENERAL 200 HUMIDIFIER—and watch your profits soar!

Give Your Customers the Famous Filtering Efficiency of WOOL FELT—GENUINE GF CARTRIDGES

One look at a General Filters Replacement Cartridge tells you here is more than cotton waste or impregnated paper. Here is the finest WOOL FELT — plus fine mesh screen center core (with patented treatment!) that positively prevents lint from escaping into oil lines. This specially treated core eliminates danger of oil bypassing, and provides finer filtration by making inner surfaces of the felt more dense. Here also is practical "step-back" cartridge design for more usable filtering area—and cleaner, better burning oils.

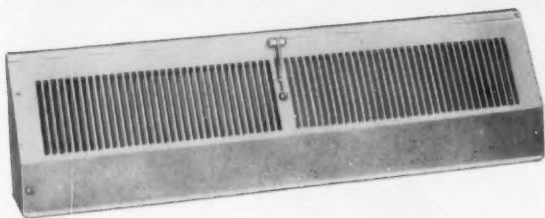
Shops featuring famous GF cartridges need stock and sell only one line . . . because Generals fit practically every filter housing model! Regardless what filter you've been selling, make sure of renewing filtering efficiency every season (and making a handsome profit) by installing a genuine GF cartridge replacement!

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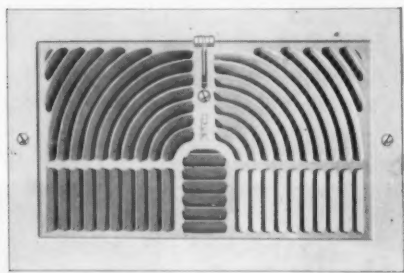
"THESE THREE AUER REGISTERS

cut my costs up to 50%...fill all my
perimeter installation needs!"

TOM E. JAMES, Price & James Heating & Air Conditioning, Berea, Ohio



Auer Perfusaire: Only 18" long — has the capacity of 4 to 8 foot units. Fits 2¼" x 12" and 2½" x 14" duct openings without cutting or fitting.



Auer No. 200 Series: for high or low sidewall installation . . . can be used as ceiling outlet . . . blankets entire wall areas with perfect air-pattern.



Auer DRP Floor Perimeter Registers—with built-in damper features rugged construction. Available in 2¼" x 14" and in sizes 4" and 6" wide, 10", 12", and 14" long.



Sheet metal men everywhere are discovering and "cashing-in" on the cost-saving features of Auer Perimeter Registers and Grilles.

For use with heating, cooling or combination heating-cooling jobs, Auer diffusers are designed for easy installation without cutting or fitting. Engineered construction provides perfect air-flow pattern while built-in dampers provide absolute system balancing.

For use with this low-cost perimeter trio, a complete line of return and intake grilles is available for either vertical or horizontal installation.

For full details on how Auer Registers and Grilles can help you cut *your* costs; write to:

Auer

REGISTERS
and GRILLES

THE AUER REGISTER COMPANY

"REGISTERS AND GRILLES FOR EVERY HEATING AND COOLING NEED"

6602 CLEMENT AVENUE CLEVELAND 5, OHIO

equipment developments

(Continued)

Year 'Round Air Conditioner

"WEATHER SELECTOR" year 'round unit comprised of an air cooled condensing unit which delivers 3 ton cooling capacity and 95,000 Btuh input gas fired furnace—Typhoon Air Conditioning Co., Div. of Hupp



Corp., Dept. AA, 505 Carroll St., Brooklyn 15. Cooling coil slips into cooling housing at installation or later. Cooling coil is 10 $\frac{3}{8}$ in. high. Condensing unit is installed remotely; furnace and cooling coil units

are designed for closet, alcove or utility room installation in basementless homes. Duct system and blower are designed to handle air movement required for cooling.

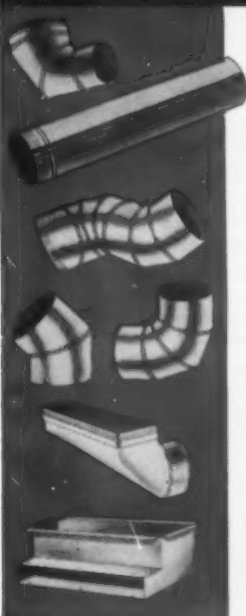
Oil Burner

OIL BURNER in one piece cast aluminum housing, said to handle 0.75 to 1.65 gph, in tube sizes from 4 to 9 in., and available in either flange or pedestal mounting—Sundstrand Engineering Co., Dept. AA, 1325



Seventh St., Rockford, Ill. Motor is 1725 rpm; air tube is 4 $\frac{1}{8}$ in. outside diameter in heavy steel; squirrel cage blower is mounted on motor shaft; fuel unit is standard single stage with built-in strainers and regulating valve; unit weighs 43 lb packed.

Easy to TRANSPORT, HANDLE & INSTALL Rust-Proof and Efficient!



From a practical standpoint, there are many sound reasons for installing Char-Gale aluminum fittings. Highly workable and easy to install, aluminum is also easy to transport and handle before it gets to the job.

In dealing with the customer, Char-Gale aluminum fittings offer many *additional* advantages. Because aluminum is rust-proof, it will never rust out and require costly replacement. This is particularly important for customers buying or planning to buy cooling equipment. In addition, this corrosion resistance keeps the inside surface smooth so that the air flows faster, for lower operating cost and greater efficiency. Efficiency also results from the low heat emissivity of aluminum, which minimizes the heat loss by radiation. And aluminum is an acoustically "dead" metal, which means that properly installed aluminum ductwork is silent.

Also a full line of galvanized fittings and rain carrying goods.

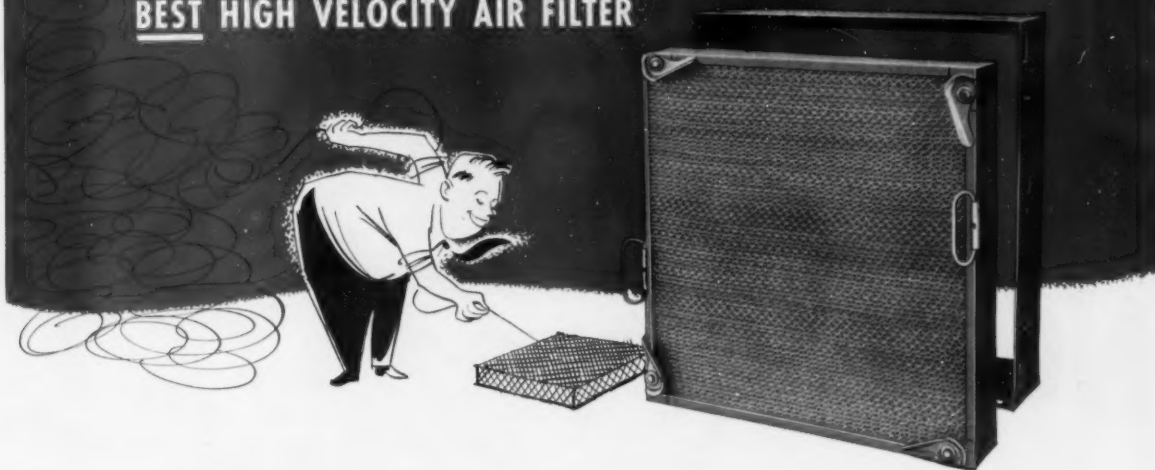
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FITTINGS
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CHAR-GALE



Rapid, nation-wide delivery service by Char-Gale's own fleet of trucks means prompt delivery direct to you. Reduces your inventories to save you money and space.

Char-Gale MANUFACTURING COMPANY
ANOKA, MINNESOTA

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BEST HIGH VELOCITY AIR FILTER



To be exact,
there's **4½ MILES** of wire
in each **20" x 20" x 2" HV UNIT!**

4½ miles of wire! That's the "inside" story of the HV unit's high cleaning efficiency in a nutshell. More wire means more viscous covered surfaces to catch and hold dust.

What's more, exclusive pyramid pocket design of the woven wire media gives the HV filter uniformly high cleaning efficiency at high or low air velocity—prevents "unloading" of collected dust. Its high capacity saves you both space and

dollars, too. Two HV's will do the job of three standard unit filters in ⅓ less space. Fast installation with easily assembled holding frames makes for further economy.

AAF HV filters, in standard sizes, are stocked at strategic locations for prompt delivery. For complete product information, call your local American Air Filter representative or write us direct for Bulletin No. 203.



American Air Filter
COMPANY, INC.

355 Central Avenue, Louisville 8, Kentucky
American Air Filter of Canada, Ltd., Montreal, P. Q.

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Control Equipment



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HEATWAVE

**GAS-FIRED
FURNACES**

A triumph in furnace engineering!

More compact! Designed to fit almost anywhere without reduction in heating surface of combustion chamber!

New styling, too! Smart two-tone baked enamel finish.

And once installed, all internal parts are removable through front-access panels. No need ever to remove the outside casing from closet or utility room installation. Tuck it away and forget it!

Definitely superior new features. Costs less money. Gives more value.

Fully factory pre-fired and tested. Needs only usual duct, gas and electrical connections.



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Subsidiary of the F. E. Myers & Bro. Co.

BOX 151

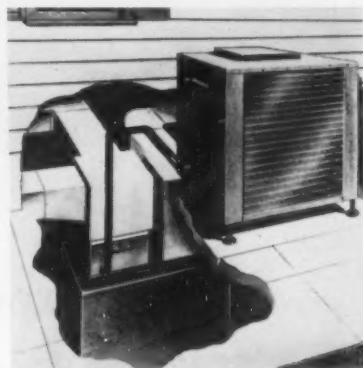
AURORA, MO.



equipment developments
(Continued)

Air Cooled Cooling Unit

MODEL ACU air cooled summer cooling unit consisting of increased capacity, multi-row condenser coil; double-inlet centrifugal blower; blower motor and drive assembled within weatherized metal cabinet—*Air Conditioning Div., Westinghouse Electric Corp., Dept. AA, Staunton, Va.* Model CAC, same unit without



compressor, is designed for converting from water to air cooling. Evaporator coil unit is slipped into plenum above furnace, connected to ACU unit located in garage, crawl space, or other remote location. Where water cooled unit is in use, the CAC air cooled condenser is installed in any convenient location and connected to existing compressor, eliminating water cooled condenser. Air discharge is vertical. Both units are in 2, 3 and 5 ton capacities.

Metal Joining Process

"METALACE" method of joining metals without use of bolts, rivets, solder, staples or other elements — *Metal Lace and Stitch Inc., Dept. AA, 255 Fifth Ave., New York 16.* Process, including all necessary punches and dies is available on licensing arrangement. Process literally laces two units together; shearing action of punch creates parallel double incision in metal sheets being worked. Spread of metal between these two incisions is rammed downward

Give all of your **COOLING**

jobs the

Balloon Test

If the balloons move about nervously—so will your service department, but if your installations are low-velocity Thermo-Base distribution systems, this test will clearly illustrate the draftlessness obtainable with Thermo-Base.

The high-velocity "soup it up" theory has had its day but is being discarded in warm air heating — just as in cooling.

Uniformity of temperatures at every level is satisfying only when accomplished draftlessly. Moving air imperceptibly is even more vital to comfort in cooling than in heating.



The grapevine is getting hotter with success stories of cooling with

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Consult Your
WHOLESALE

Consult your wholesaler for printed Proof of Performance Data and for the Comfort Guarantee.

These benefits aren't for the consumer **alone**.

The trouble you save may be your **own**.

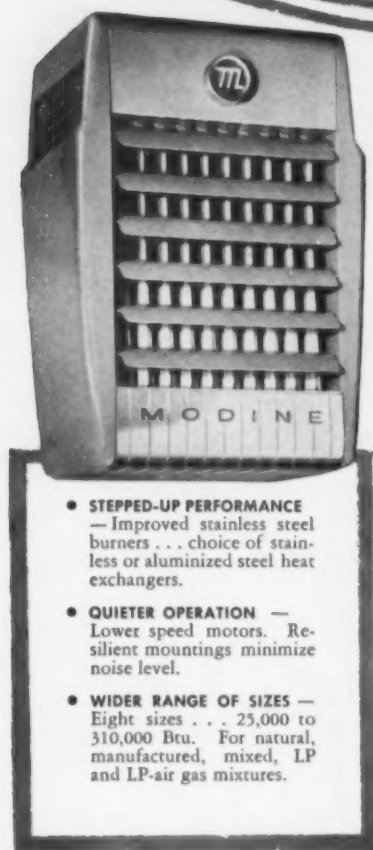
Thermo-Base Division,
Gerwin Industries, Inc., Michigan City, Indiana



Introducing a new concept in

style-setting

cost-saving
GAS UNIT HEATERS



the
Magnificent
Modine

MODINE held nothing back in creating this magnificent new gas-fired unit heater. Nationally famous designer Jean Otis Reinecke set the style . . . used sparkling, polished chrome, plus a restful gray-green finish to enhance the distinctive modern lines. And Modine engineering held unit weight down to produce a unit heater up to 50% lighter than other makes. This weight reduction means lower shipping costs for you . . . a unit that is definitely easier to handle and easier to install.

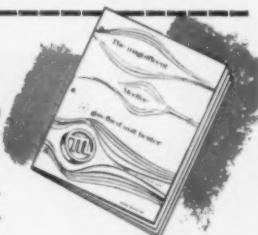
- **STEPPED-UP PERFORMANCE** — Improved stainless steel burners . . . choice of stainless or aluminized steel heat exchangers.
- **QUIETER OPERATION** — Lower speed motors. Resilient mountings minimize noise level.
- **WIDER RANGE OF SIZES** — Eight sizes . . . 25,000 to 310,000 Btu. For natural, manufactured, mixed, LP and LP-air gas mixtures.

GET FULL DETAILS FROM THIS BULLETIN

MODINE MFG. CO.
1580 DeKoven Ave., Racine, Wisconsin

I would like to know more about the new style-setting Modine Gas Unit Heaters. Please send me free Bulletin 656.

NAME
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GU-1320



equipment developments

(Continued)

against the anvil of the die beneath sheets of metal being joined and between die's immovable jaws. Depressed metal spreads sideways, creating permanent fastening wedge, reports the company.

Cooling Coil Units

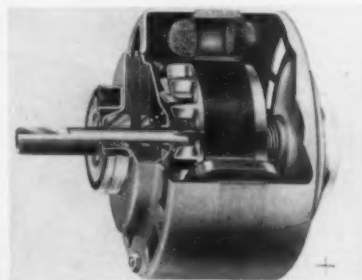
RESIDENTIAL cooling coil units with air cooled condensers in 2, 3 and 5 ton capacities—Frigidaire Div., General Motors Corp. Dept. AA, 300



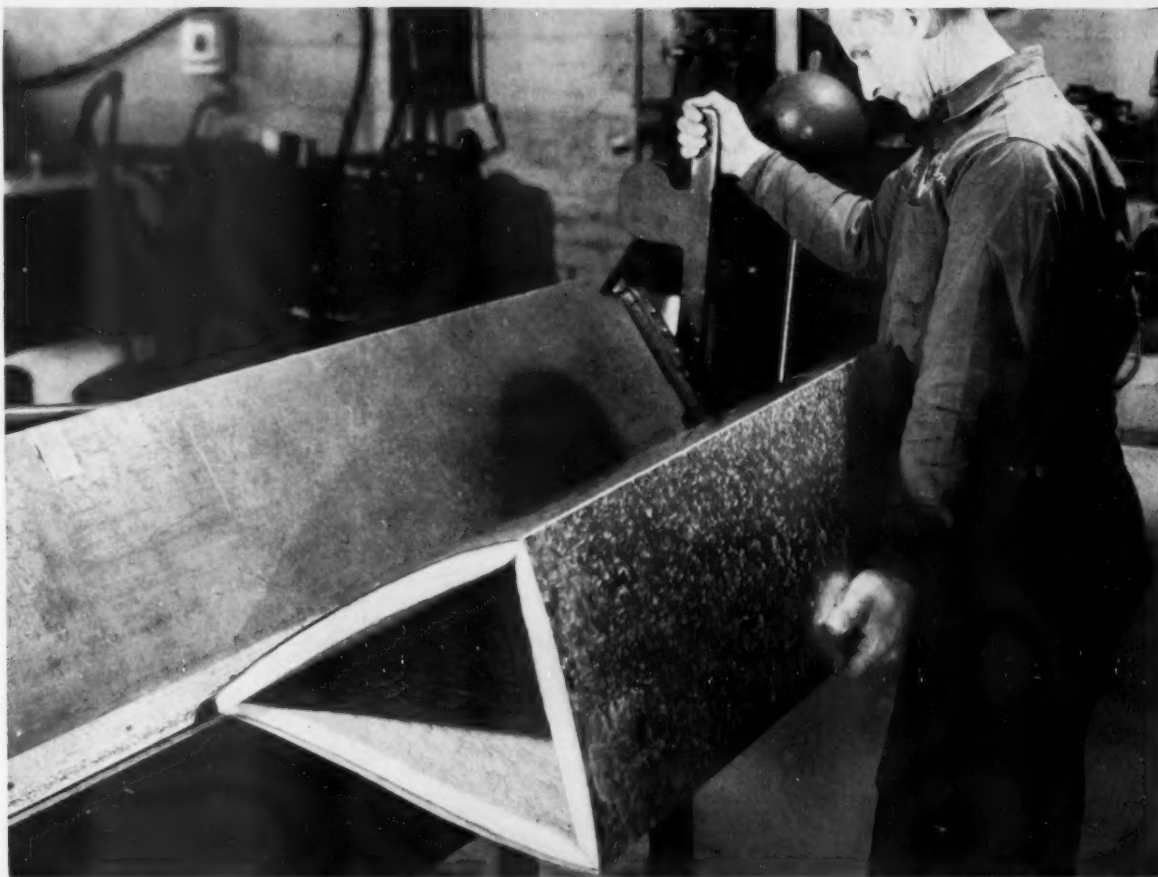
Taylor St., Dayton 1, O. Cooling coils for both vertical and horizontal air flow are in same capacities, for use with conventional warm air heating systems. Condensing units, also in same sizes and complete with compressor and steel housing, are also available for outside installation, the company states.

Fractional HP Motors

TYPES FE AND FLL fractional hp motors designed for furnace blowers and other air moving applications—



Westinghouse Electric Corp., Dept. AA, P. O. Box 868, Pittsburgh 30. Bearing and lubrication system features: self-aligning bearings, large



A single piece of L·O·F Glass Fibers' Duct Liner can be cemented to metal and formed in the brake!

Right from the roll to the duct!

Unlike old-fashioned, rigid insulation, L·O·F Glass Fibers' Microlite and Super·Fine blanket insulations are resilient and flexible. They handle pleasantly, without "kid glove" treatment! Easily cut with ordinary knife! Quickly installed—without special tools or skills—L·O·F Glass Fibers' Duct Liner requires no precision cutting or fitting . . . works easily into irregular parts such as elbows. Your costs are kept to a minimum.

The extremely fine glass fibers in Microlite and Super·Fine form mil-

lions of tiny dead air cells. For this reason, they are exceptionally efficient acoustical and thermal insulations! Look at all the other important advantages . . .

- *High tensile strength . . . easy to use, reduce danger of tearing!*
- *Compactly packaged in standard widths . . . compressed to take up a minimum of storage space, yet spring back to original thickness when unrolled.*
- *Lightweight . . . liner adds an*

insignificant amount of weight!

- *Fire-resistant . . . glass fibers do not support combustion!*
- *Permanent . . . will not rot!*

Neoprene- or vinyl-coated Microlite and Super·Fine are recommended for normal and high velocities . . . uncoated liner may be used for lower velocities. For complete information, contact your nearest distributor; or write *L·O·F Glass Fibers Company, Dept. 45-76, 1810 Madison Avenue, Toledo 1, Ohio.*



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TOLEDO 1, OHIO

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SILENTRIDE[®] V-Belts

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Euclid 23, Ohio

equipment developments

(Continued)

capacity bearing reservoir, window in bearing to assure positive contact between wick and shaft, grooves in babitted bearing to provide positive oil film between journal and bearing. Type FE shaded-pole motor has constant speed; it is rated 1/30 to 1/8 hp on 115 or 230-v, 60 cycles, at 1050 rpm. Type FLL permanent-split capacitor motor is also constant speed and switchless; it is rated 1/30 to 1/4 hp on 115 or 230-v, 60 cycles, at 1075 rpm. Reversible motors are also available, the company states.

Power Squaring Shears

MODEL 14-U-10 power squaring shears featuring precision gaging, positive holddown and built-in blade clearances—Peck, Stow & Wilcox Co., Dept. AA, Center St., Southington, Conn. Other features, according



to the manufacturer, are: embedded scales; individual plunger, self-compensating holddown; adjustable finger guard; convenient hand hole; four-edge alloy steel blade; full length T-slot in bed; full skirt safety guard; removable clutch housing; clutch control single stroke or repeat action; full length clutch treadle; precision back gage; fully visible cutting line.

Light Duty Motor

LIGHT WEIGHT a-c electric motors featuring conversion to magnesium for stator shells and end frames and new design for stator laminations — Redmond Distributors, Inc., Dept. AA, Owosso, Mich. Units are redesigned version of AY shaded pole line, rated from 1/35 through 1/4 hp and CY split capacitor line rated 1/30 through 1/3 hp, for direct

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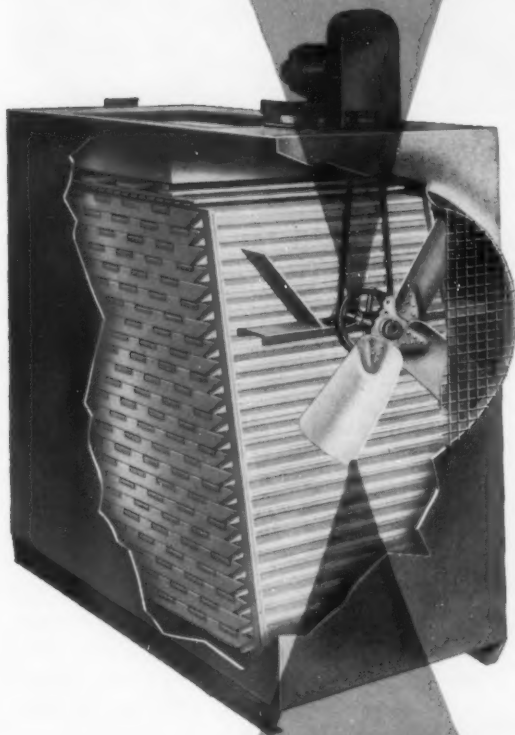
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*So Halstead & Mitchell
engineers said:*

'THIS HAS A BEARING ON COOLING TOWER PERFORMANCE'



**20-Year
Guarantee!**

on the wetted deck surface against rotting or fungus attack is an extra given you only by Halstead & Mitchell. Combined with the H & M Protected Steel concept, it offers unsurpassed protection against water and weather.

**H & M COOLING TOWERS ARE AT LEADING
WHOLESALEERS EVERYWHERE**

Nothing has more bearing on cooling tower performance and life than do tower fan bearings. On them turn the induced draft cooling tower's *only moving parts*.

Announcement by Halstead & Mitchell engineers of a *permanently sealed and lubricated fan bearing* means a bearing so designed as to completely eliminate moisture—and consequent rusting of the bearing balls and races. The *elimination of periodic greasing* cuts your tower maintenance costs to an absolute minimum . . . literally adds years to cooling tower life.

With not a single bearing failure reported from the hundreds of these "new bearing" towers in actual use, Halstead & Mitchell offers you . . . now more than ever . . . the best buy in cooling towers on the market today

SUPER-QUIET, 4-BLADE FANS, TOO!

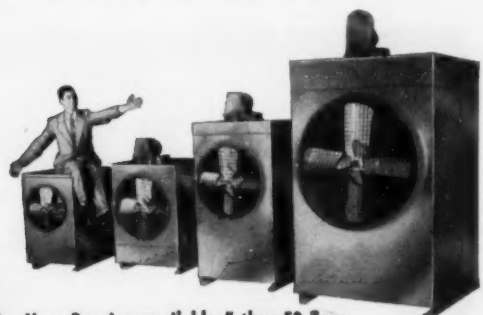
There are new fans, too, on Halstead & Mitchell Cooling Towers—deep-pitch fans which operate at much, much lower speeds—actually *cut cooling tower noise level in half*. Sturdy, stainless steel fan blades . . . stainless steel fan shafts . . . make sure your tower will have not only a quiet life, but a long one, too!

For Complete Details, Write for Bulletin CT-584



Halstead & Mitchell

BESSEMER BUILDING, PITTSBURGH 22, PA.



New Bearing available 5 thru 50 Tons



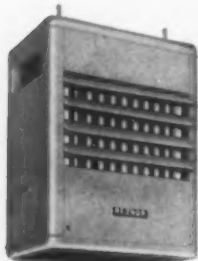
**"Reznor is the one name in gas unit heating
my customers all know and accept"**

"I used to be surprised when so many of my unit heater prospects knew the name Reznor. When they accepted unquestioningly Reznor heaters as a quality product. Then I realized why.

"Reznor is the heater they see every day—in the drug store where they stop for cigarettes, the filling station where they buy gas, the barber shop where they get their hair cut. After all, Reznor makes nearly one out of two gas unit heaters sold. My prospects have as many chances to see Reznor heaters in operation as they do all other makes combined. And the fact that other businessmen they know are happy with Reznor heaters makes my selling job a lot easier.

"There's another thing, too. A lot of my prospects mention to me that they've seen Reznor advertising in the magazines they read. "The Saturday Evening Post." "Newsweek." "Nation's Business." "Industry and Power." "Mill and Factory." "Mechanical Engineering." No other unit heater manufacturer backs its dealers with such a powerful advertising program.

"I think that Reznor is the finest gas unit heater I could possibly offer my prospects. I'm glad that, because of its widespread acceptance, fine reputation, and powerful advertising, it's also the gas unit heater my customers are most willing to accept."



It's the same story everywhere you go. Reznor gas unit heaters are easier to sell because Reznor gas heater units are better known. Why don't you get on the bandwagon? Call your nearby Reznor distributor for complete details. You'll find him listed under "Heaters-Unit" in the yellow pages of your telephone directory.



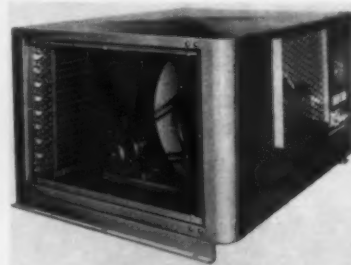
equipment developments

(Continued)

drive heating, ventilating and air conditioning equipment.

Add-On Cooling Unit

RESIDENTIAL COOLING coil in 2, 3 and 5 ton sizes and remote air cooled condenser designed for add-on application with warm air furnaces—McQuay, Inc., Dept. AA, 1600 Broad-



way, Minneapolis 13. Coils are suitable for fluorinated hydrocarbon refrigerant types 12 and 22. Horizontal air flow evaporators are designed for insertion in ductwork on either return or discharge sides of furnace. Vertical model installs in plenum of counterflow furnace. Both models are designed for internal mounting of the expansion valve, the company states.

Roof Ventilators

"VENTURETTE" aluminum power roof ventilators with direct and V-belt drives ranging in capacities from 245 to 18,000 cfm — *Uno Ventilator Co., Dept. AA, 1236 Eastern Ave., Malden 48, Mass.* Featured in centrifugal models are aluminum spark-proof impellers, non-overloading design. Package units are in square mounting frame ready for placing over roof curb. Quiet models have been designed for hospitals, schools and other public buildings.

Air Velocity Meter

MODELS 400-5 and 400-10 dual purpose meters which test air velocity and static pressure — *F. W. Dwyer Mfg. Co., Dept. AA, P. O. Box 373, Michigan City, Ind.* Smaller model

Meet the tightest-coated sheet yet produced!



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SOFTITE
COP-R-LOY[®] GALVANIZED SHEETS

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Skuttle FEATURES
 and you'll sell more!



Model 450

Skuttle
 UNIVERSAL HUMIDIFIER
 WITH VAPOGLAS PLATES

Only Skuttle is mounted outside heating plant casing. Easily installed. Saves time.

Up to 460 square in. evaporating area with Vapoglas plates. Means more efficiency.

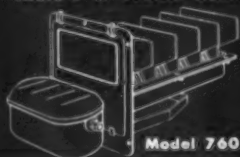
Maintains lower pan temperatures. Less lime in water and less clog.

Skuttle's exclusive plate design allows unrestricted air-stream.

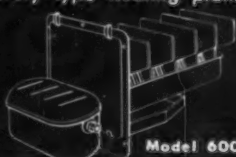
For further information, write to:



There's a Skuttle humidifier for every type heating plant



Model 760



Model 600 B

equipment developments
 (Continued)

measures 0 to 5 in. of water, 400 to 9000 fpm; larger unit measures 0 to 10 in. of water, 400 to 12,600 fpm of air. Meter is transparent plastic, has no moving parts. Carrying case is custom fitted for all accessories: 18 in. stainless steel calibrated pitot tube, rubber tubing with connectors, mounting clips, additional gage oil and plastic laminated instruction and data cards.

Tank Fill Alarm Filter

FILTER TO prevent entry of bugs and other foreign matter into resonance chamber of "Ventalarm" tank fill signals and gages—Scully Signal Co., Dept. AA, 174 Green St., Melrose,



Mass. Noncorroding protection device is positioned over whistle exit orifice, and is said not to interfere with sound, restrict venting, or conflict with fire protection standards limiting screens in venting systems.

Cooling Towers

REDESIGNED "Record Dri-Fan" cooling towers with automatic modulating dampers for control of water temperature — Refrigeration Engineering, Inc., Dept. AA, 7250 E. Slauson Ave., Los Angeles 22. Modulating dampers, controlled by thermostat, keep head pressure from going too low; end switch cuts off fan motor when dampers are completely closed, to regulate amount of air

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and something

MORE

with the

Norman Southerner®

horizontal forced-air, gas fired furnace

These are just four of the many Norman features that mean faster, lower-cost installations ... plus better profit protection on every job ... plus a 10-year written factory warranty backed by the longest record of trouble-free operation in the horizontal heating field.

You can install the Southerner, then forget it — confident in its ability to keep your customers warm and comfortable all winter, every winter.

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Write today for full information plus your free copy of the Norman Sketchbook, the heating industry's most profitable visual sales tool.



Manufacturers and designers
of quality gas heating and
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1.

Wider range of input capacities

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Approved by A.G.A. as a central heating plant or unit heater.

3.

A.G.A. approved with static pressures up to 0.50" (to accommodate larger blowers for use with air conditioning).

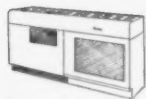
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A. G. A. approved for temperature rises of 70° to 120°F. (making it adaptable for economical small pipes.)

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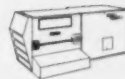
Schoolroom Heaters



Upshot and inshot Norman residential and industrial conversion burners



Duct Furnaces.



Unit Heaters



**OVER 400
BURNERS
REPLACED WITH
THIS
FUEL
SAVER**



LO-BLAST ECONOMITE

POWER GAS CONVERSION BURNER

In the small home development of 472 homes in Marquette Heights, near Peoria, Illinois, illustrated above, Lo-BLAST Economite Power Gas Burners replaced oil burners originally installed. The reasons are evident when the trouble-free performance and economy of the Economite are considered.

Power burner design assures perfect combustion, regardless of natural draft conditions—*saves an average of 10% in fuel*—ideal for down-draft heating plants. The Economite burns so smoothly you can't tell when it's running.

Every Economite is factory-tested on gas and shipped assembled, fully equipped with fool-proof safetys.

Lo-BLAST Power Gas Burners are available in capacities from 70,000 to 20,000,000 BTU input. Write for literature.

**MID-CONTINENT
METAL PRODUCTS CO.**
1960 N. Clybourn Ave., Chicago 14, Ill.

equipment developments

(Continued)

through tower. Dampers have opposed action balanced blades. Air is blown through the unit instead of pulled through fan section, the company states, to eliminate saturated air from fan section. Also featured are watertight access doors and water bleed which is said to assure non-clogging action. Tower is all metal construction.

Panel Housing for Masonry Chimney

BRICK PANEL housing for packaged masonry chimney in red, buff and white—*Van-Packer Corp., Dept. AA, 1049 State St., Bettendorf, Ia.* Designed to provide



variety for project builders, housing has brick-like texture and natural color mortar lines, is constructed of fireproof, weatherproof cement asbestos. Unit can be used with coal, oil or gas; housing is packed together with flashing, the company states.

Round Duct Fan

TUBEAXIAL DUCT FAN for ventilation and exhaust applications—*Peerless Electric Co., Dept. AA, 1401 W. Market St., Warren, O.* Diameters match standard duct sizes; graduated horsepower and capacities are available for each size. V-belt drive and motor are isolated from air stream; fan and motor are of ball bearing construction and may be mounted in any position. Blades are non-sparking cast aluminum. Steel housing is arc welded; angle iron rings on each end of housing are punched with eight holes for mounting in round duct. Fan ball bearings are enclosed and sealed.

Notching Machines

"UNINOTCH" corner, vee and edge notching units designed for quick changing of dulled punch and die steels with new or sharpened steels—*Punch Products Corp., Dept. AA, 3800 Highland Ave., Niagara Falls, N. Y.* Changing cutting steels can be performed during production run without removing unit from setup, the company states. Series A hole punching and notching units have 8 3/8 in. shut height and 3 1/2 in. die height with operating capacity up to 1/4 in. metal thickness.



Compare Permaglas® cooling

and you'll soon be selling the only
all-new line in the industry

YEAR-ROUND UNITS

Sleek, handsome, easily installed as two ready-to-operate components. Oil or gas-fired heating, with Permaglas ceramic-coated heat exchanger. 100,000 to 160,000 BTU input. Water or air cooling with 2, 3, or 5-ton capacity. 16 year-'round models!

HORIZONTAL UNITS

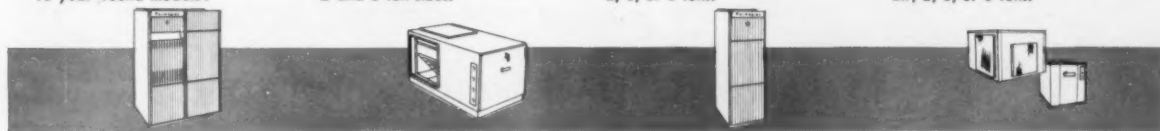
Highly flexible, easily installed self-contained water cooled units. Use them in any ductwork system, or as ductless units. Horizontal units are ideal for under ceiling utility room or basement installations, or for use in attics or crawl spaces. 2 and 3-ton sizes.

VERTICAL COOLING UNITS

Trim, smartly styled Vertical units are a perfect match for Permaglas Hi-Boys—work well with any high-boy. May be serviced entirely from the front. Air cooled or water cooled. Vertical units are available with or without blower. Hermetic, 2, 3, or 5 tons.

REMOTE COOLING UNITS

Newly styled remote condensing units may be installed outside, or in attic, garage, or basement. Choice of horizontal, vertical, or "A" type evaporators. Charged, sealed units and charged tubing simplify installation. For water or air; 2, 3, or 5 tons.



Permaglas®

HEATING and COOLING



Through research  ...a better way

A.O. Smith

Permaglas Division, Kankakee, Illinois
International Division, Milwaukee 1, Wisconsin

Permaglas is going places . . . are you aboard?

A. O. SMITH CORPORATION

Permaglas Division, Kankakee, Illinois, Dept. AA-756

Gentlemen: Please send me complete details about Permaglas Heating and Cooling.

Name.....Title.....

Company.....

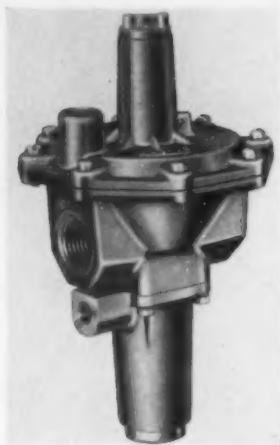
Address.....

City.....Zone.....State.....

equipment developments

(Continued)

Series B units have $5\frac{1}{2}$ in. shut height and $2\frac{19}{32}$ in. die height with operating capacity up to $\frac{1}{8}$ in. metal thickness.



Pressure Regulator

SL 200 GAS pressure regulator in combination with "Thermo-Electric" pilot control with safe lighting feature—*Thermac Co., Dept. AA, 800 E. 108th St.,*

Los Angeles 59. Unit is designed to minimize number of separate control units installed on manifold. Safe lighting feature is operated by red push button at the bottom. Unit is in $\frac{1}{2}$ and $\frac{3}{4}$ in. pipe sizes for capacities through 250,000 Btuh.

Bending Brake for Forming Letters

No. 99 LETTER forming bending brake designed for applications such as making solid or channel type sheet metal letters—*Whitney Metal Tool Co., Dept. AA, 91 Forbes St., Rockford, Ill.* Unit will handle metal through 20 ga, including stainless steel. Upper jaw is in form of an open box to provide adequate stiffness yet remove as much superstructure as possible so strip being folded can be laid back over top of machine. Upper jaw, lower jaw and apron contain matching $\frac{3}{16}$ in. slots spaced on 1 and $\frac{1}{2}$ in. centers to permit bending drum return strips which have seamed and folded edges. Slots are $\frac{3}{4}$ in. deep; jaws are 12 in. wide.

Elevating Tailgate for Trucks

"JIFFY-LIFT" elevating tailgate for pickup and express truck bodies—*Mid West Body & Mfg. Co., Dept. AA, Paris, Ill.* Unit is ready for installation with attachment of six bolts. Lift weighs 175 lb, has capacity of 600 lb; it is all steel, ramp-type construction.

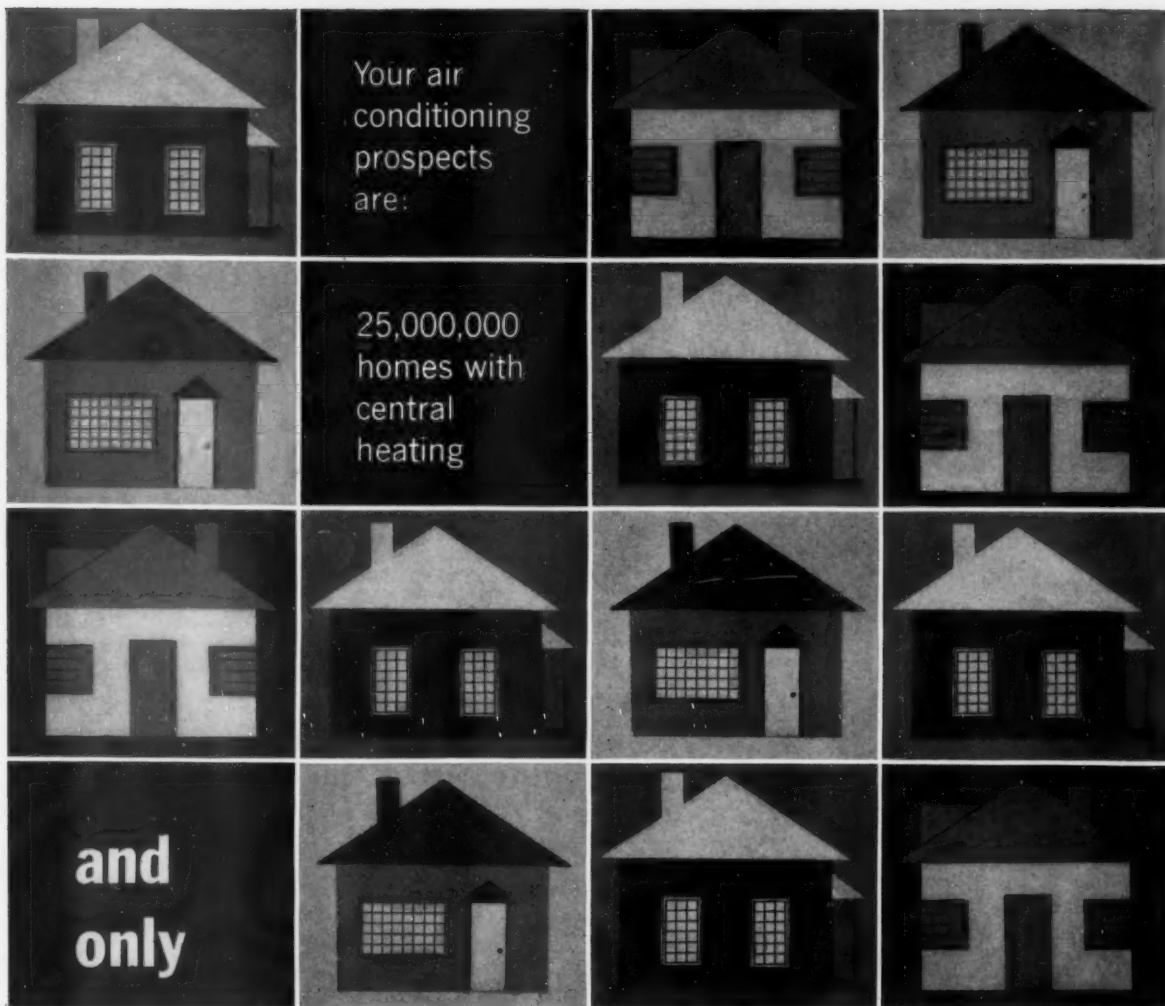
Conductor L. Bow says:

NO RAW EDGES TO RUST WHEN YOU INSTALL CINCINNATI ELBOWS BECAUSE THEY'RE HOT-DIPPED IN ZINC AFTER FORMATION—EASIER TO INSTALL, TOO, BECAUSE THEY'RE SHAPED AND TAPERED TO FIT ANY STANDARD SIZE PIPE—ALL SIZES, ANGLES, GAUGES OR METALS, INCLUDING COPPER, ALUMINUM, STAINLESS OR GALVANIZED STEEL—ASK YOUR JOBBER!!

CINCINNATI ELBOW CO.

4730 MADISON ROAD • CINCINNATI 27, OHIO





Worthington's FLEXI-COOL fits them all!

Only FLEXI-COOL has exclusive sectional construction—is so easy to install in homes with central heating systems. Look how many places it fits:

For warm air systems:

Attic: Install low cost cooling cycle in attic and use with existing furnace blower and filters.

Crawl space: Hang FLEXI-COOL from floor joists in crawl space. Connects easily to warm air heating system.

Basement: Use blower package cooling cycle (blower optional) with basement furnace.

Over closet: Put FLEXI-COOL cycle in attic directly over closet containing furnace. Con-

nects easily . . . saves floor space for other uses.

Remote installation: Place cooling coil in duct work over furnace and connect to outdoor air or water-cooled condensing unit!

For wet heat systems: In ranch houses, complete unit fits in attic . . . distributes cool air through low-cost ducts to ceiling or sidewall grilles. In two-story houses, separate fan, coil and filter units are installed in attic and basement. Both are connected to outdoor air-cooled condensing units.

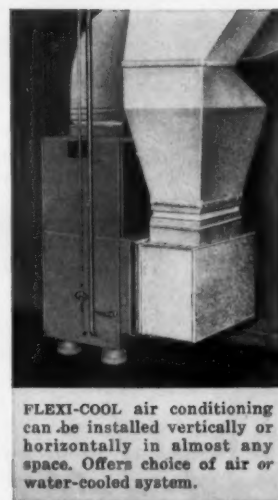
For complete details on this profit-making line, write Worthington Corporation, Air Conditioning and Refrigeration Division, Harrison, New Jersey.

A.6.114

WORTHINGTON



CLIMATE ENGINEERS TO INDUSTRY, BUSINESS AND THE HOME



FLEXI-COOL air conditioning can be installed vertically or horizontally in almost any space. Offers choice of air or water-cooled system.

new literature . . .

Versatile Ring and Circle Shear

ILLUSTRATED BULLETIN 70 supplement presents data on No. 31-RC ring and circle shear. According to the company, the machine cuts both straight lines and irregular outlines as well as circles, circular holes and rings—*Niagara Machine & Tool Works, Dept. AA, 683 Northland Ave., Buffalo 11, N. Y.*

Water Towers

DATA sheet illustrates 3, 5, 7½ and 10 ton water towers and gives specifications for each model. The units feature safety screens in both front and rear, heavy copper float valves and stainless steel distributing trays. Other features claimed include low installation and operating cost, low maintenance cost, and quiet operation—*The Fulton Steelcraft Co., Dept. AA, 2000 Broadway, Swanton, O.*

Attenuators for High Velocity Systems

BULLETIN describes attenuators for use in high velocity air conditioning systems. The unit, responsive to a thermostat, mixes warm and cold air in proper proportions and discharges the mixture at low velocity into the space to be conditioned.

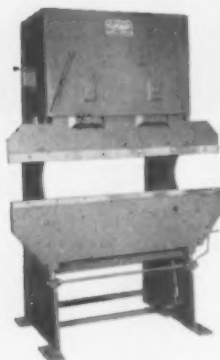
According to the company, an automatic adjustable volume control maintains constant volume of circulated air. Type V3 units, designed for under window or wall mounting, are available in capacities ranging from 100 to 300 cfm. Type H models for overhead installation range in capacity from 100 to 800 cfm—*Buensod-Stacey, Inc., Dept. AA, 60 E. 42nd St., New York 17.*

Cooling Towers

BULLETIN C-H. 56110 emphasizes improvements in "Wat-R-Miser" cooling towers such as the addition of complete housing watertight seal to prevent leakage at joints, full motor guard protection, and raised legs in place of flush-to-the-floor design. Three tables detail 1) entering and leaving tower water temperatures; 2) water flow gpm; and 3) nominal capacity tons refrigeration. The series comprises 13 cooling tower models, listing capacities from 1500 up to 24,500 cfm—*Drayer-Hanson Div., National-U.S. Radiator Corp., Dept. AA, 3301 Medford St., Los Angeles.*

Sales Training for Wholesalers

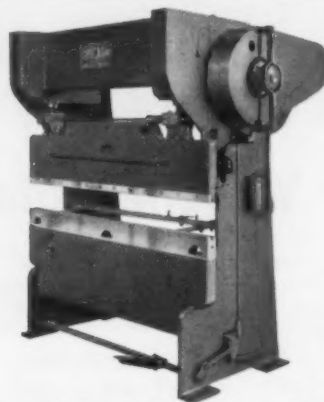
SALES TRAINING for Small Wholesalers is No 11 in the series of Small Marketers Aids published by the Small Business Administration. The pamphlet points



Model 131 Press Brake
11 Ton Capacity

Cut Production Costs on...

BEADING
BENDING
BOX and PAN FORMING
CHANNELING
CORRUGATING
CURLING
FLATTENING
HEMMING
JOGGING
MULTIPLE PUNCHING
NOTCHING
OFFSETTING



Models A, B, C, and L Press Brakes
Advanced Design - 30 to 60 Ton Capacities

PRESS BRAKES

11 to 60 Ton Capacities for Sheet Metal Work

Complete recommendations for any job on request.

6094

DREIS & KRUMP
MANUFACTURING CO.
7404 S. Loomis Boulevard, Chicago 36, Ill.



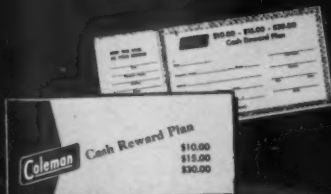
PRESS BRAKES • HAND AND POWER BENDING BRAKES
STRAIGHT-SIDE PRESSES • INDUCTION HARDENED DIES
SPECIAL METAL-FORMING MACHINERY

Use these **Coleman** local promotions to BUILD A LIVE PROSPECT LIST

For HEATING/COOLING Sales

Brand new approach!

Invite the home owner prospect to be his own "Comfort Engineer" and save \$50 on the installed price of his Blend-Air system. Once he earns his \$50 credit certificate, you KNOW you've got a live prospect. Program includes survey forms, yardsticks imprinted with your name, credit certificates, co-op ads.



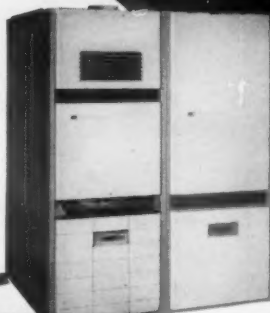
Proved by thousands

of sales, hundreds of dealers! Pre-season Trade-in campaign sells prospect on trading his window unit ("up to 90% allowance") for Blend-Air central cooling. Coleman will co-op ads, radio, TV.

Tested, proved

year-round "use-the-user" campaign enlists the aid of satisfied Blend-Air customers and others in searching out new prospects.

plus . . . many other ideas, ads, displays and direct mail. Tie-ins with national advertising in LIFE, Saturday Evening Post, Sunset Household and Small Homes Guide.



COLEMAN SINCE 1900

— makers of lamps, lanterns, camp stoves, home heating and air conditioning.

COLEMAN Vit-Rock® water heater...

backed by 10-year warranty and EXCLUSIVE \$500 Bond . . . strongest guarantee in the industry! Only Coleman has the rock lining that can't rust!



Use Blend-Air EXCLUSIVES to close more sales!

- ONLY COMPLETELY PACKAGED SYSTEM . . . pre-fabricated at factory to reduce layout time, eliminate costly shop work.
- INSTALLS IN HALF THE TIME — smaller 3½-inch ducts save labor and inventory.
- COMPLETE LINE of Vertical and Plenum Coolers to install with any heating.
- BEST HUMIDITY CONTROL with exclusive Coleman blenders.
- LOWEST COST COOLING to operate with exclusive Air-Mist evaporative condenser.

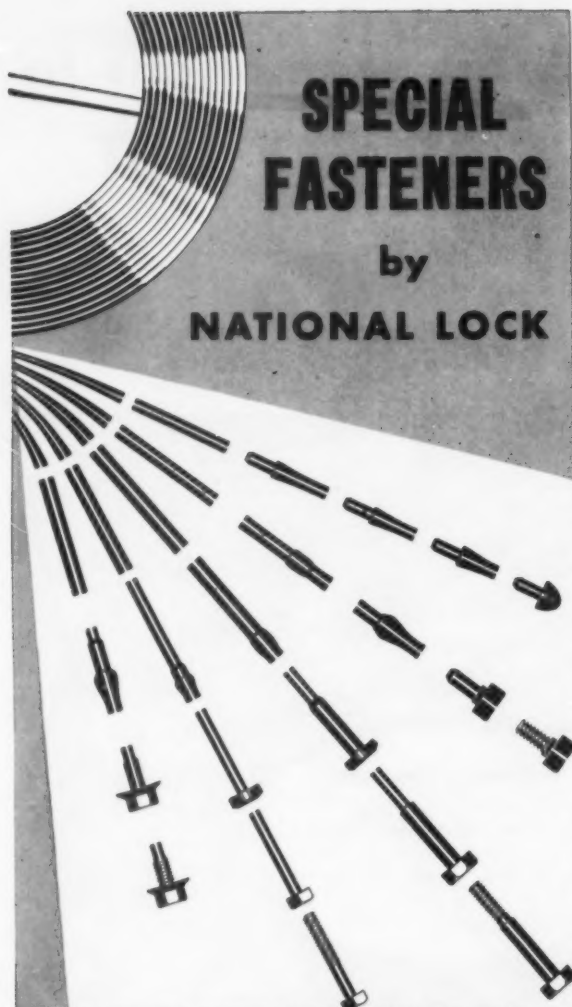
MAIL COUPON TODAY for complete information!

The Coleman Company, Inc.

Dept. AA-163 Wichita 1, Kansas

Gentlemen: Please send me complete information on Coleman Blend-Air cooling and the 1956 Coleman local promotions. I sell ☐ gas or LP-gas, ☐ oil heating equipment.

Name _____
Firm Name _____
Address _____
City _____ State _____ Zone _____
State _____



**UTILIZE THIS DEPENDABLE SUPPLIER FOR YOUR
STANDARD AND SPECIAL-PURPOSE FASTENERS**

Whether your "specs" call for fasteners of special lengths, types, materials and finishes, or whether your requirements dictate strict adherence to tight delivery schedules, you'll find the solution to your problem in National Lock. Here extensive research, engineering and production facilities are combined to supply uniform-quality fasteners of every description . . . on time. Call upon National Lock to work with you in developing such other hardware as handles, hinges, catches, pulls, locks, casters and knobs . . . in die cast, stampings, compression and injection molding. Write us for full information.

QUALITY HARDWARE . . . all from 1 source



NATIONAL LOCK COMPANY

Rockford, Illinois • Fastener Division

new literature

(Continued)

out that a sales training program can be based on the elements of teaching, checking and reviewing—utilizing information which can be developed from within the wholesaler's own organization. Methods of training salesmen, sales tools which can be provided for new salesmen, and the importance of continuing sales training are among the subjects discussed—*Small Business Administration, Washington 25, D. C.*

Heating and Cooling Equipment

CATALOG covers "Airline" heating and cooling equipment, incinerators and gas fired hot water heaters. Included are descriptions of coal, oil and gas fired furnaces; air and water cooled air conditioners; and gas fired conversion burners. Furnaces described include lowboy and horizontal models. The catalog is illustrated throughout with photographs of complete units as well as cutaway views showing working parts—*Ingersoll Conditioned Air Div., Borg-Warner Corp., Dept. AA, 760 E. Vine St., Kalamazoo, Mich.*

Refrigerants

WALL CHART gives physical and vapor pressure data for "Genetron" fluorinated hydrocarbon refrigerants. The chart is intended to be used as an educational aid and reference source for data on the four major "Genetron" refrigerants. Such data as freezing point, boiling point, liquid and vapor densities, solubilities, etc., and vapor pressures over a wide temperature range are provided. Free copies are available to air conditioning wholesalers and manufacturers as well as schools and colleges conducting air conditioning courses—"Genetron" Department, General Chemical Div., Allied Chemical & Dye Corp., Dept. AA, 40 Rector St., New York 6.

Perforated Metal Sheets

BROCHURE presents information on perforated metal sheets, including sheet sizes, type and gage of metal and percent of open area. Perforated patterns are illustrated at actual size—*The Harrington & King Perforating Co., Inc., Dept. AA, 5655 Fillmore St., Chicago 44.*

Adjustable Slotted Air Diffusers

SLOTTED AIR DIFFUSERS featuring adjustable grid-type dampers are described in bulletin K-27. The diffusers are available in two models — KSL-1 for single air stream discharge in 3½ and 6 in. widths, and KSL-2 for multi-directional discharge and greater capacity in a 12 in. width. Both models are made in 2, 3, 4 and 6 ft lengths. By omitting the end flanges at each

Sell Comfort
at Low Cost



Install Zone Control Systems

For Heating and Air Conditioning
the Economical
ZONETROL Way

CRISE

ACRO



Crise Zonetrol units may be purchased individually or in packages including the thermostat and linkage.

Zone control is now within the budgets of hundreds of your customers who have always wanted this comfort and convenience.

Simplicity is the big feature of the Zonetrol. Each is a complete, easy-to-install self-contained unit. *No expensive master controls, power boxes or transformers are required.* Just install a Zonetrol

on the duct leading to the zoned area. Then, in response to thermostatic control, it will open or close the duct damper and, at the same time, start or stop the heating equipment . . . automatically.

For additional information and prices see your wholesaler or write us.

ACRO
MANUFACTURING COMPANY

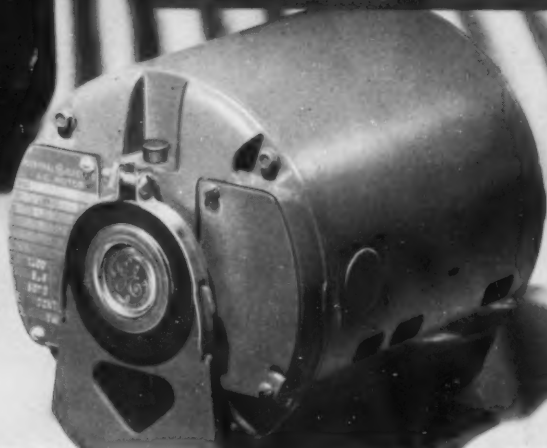
CONTROLS DIVISION

COLUMBUS 16, OHIO

NOTE TO HEATING EQUIPMENT DEALERS

There have been big design advances in electric motors for products you sell. Since these advances can affect your profits, we ask . . .

Which motor would you choose?



SMALLER, LIGHTER G-E MOTOR (right) is for furnace fan use. This same outstanding General Electric quality is available in both circulating pump motors and oil burner motors.



G-E OIL BURNER MOTOR is extremely lightweight ($\frac{1}{4}$ hp weighs only 11 lbs.) to make installation faster and easier—yet it delivers dependable, full-power performance.



PROMPT, LOCAL SERVICE by your G-E Small-motor Service Station helps you give your customers efficient service. See the "yellow pages" for the one in your area.

If you were to select the motors for the heating equipment you sell, which design would you choose? The right choice is important because recent design improvements are the most important made in many years.

This big difference in motors is the result of design advances pioneered by General Electric. Such G-E features as moisture-resistant, long-lasting Mylar® insulation, a welded-on speed nut for simpler, faster installation, and a 50% greater oil supply for doubled lubrication life are important to you and your customers.

There's more to the G-E story, too! G.E. gives you the sales help of a "name" motor that study after study shows most people recognize and prefer. And G-E motors are backed by an extensive network of local G-E Small-motor Service Stations which can help you provide prompt motor service.

To take advantage of today's big difference in motors, specify "equipped with G-E motors" on your next equipment order. Don't forget to ask for G-E replacement motors—for the same profitable reasons.

*DuPont trade-mark for polyester film.

Progress Is Our Most Important Product

GENERAL  ELECTRIC

FOR FREE FULL-COLOR BULLETIN on the motor featured above, write to: Sect. 702-34, General Electric Co., Schenectady, N. Y.

And order G-E motors for replacement, too!

new literature

(Continued)

joint, several may be installed end to end to form a continuous diffuser line in wall or ceiling. Capacity is from 50 to 300 cfm per ft of length depending upon the model and space to be served—*Connor Engineering Corp., Dept. AA, Shelter Rock Lane, Danbury, Conn.*

Servicing Gas Water Heaters

WATER HEATER SERVICE MANUAL (248 pages) presents data designed to aid in the selection, installation and servicing of gas water heaters. Single copies may be purchased for \$1.50 each; ordered in quantities of 10 or more, the manual may be obtained for \$1.25 a copy—*American Gas Association, Dept. AA, 420 Lexington Ave., New York 17.*

Chimney Top

LITERATURE describes model 101 top housing for metal chimneys. Developed for use on larger homes, the housing measures 18 × 27 in. In addition, the rain cap has been increased to 11 × 14 in. The chimney is available in plain gray or simulated brick finish—*The Majestic Co., Inc., Dept. AA, 733 Erie St., Huntington, Ind.*

Gas Control

TWO SIX-PAGE BULLETINS cover series 55 "Gasapack" gas control. Each bulletin provides information regarding the design and construction of the control and lists mechanical specifications, dimensions and capacities. Bulletin G170A is designed for the use of dealers and distributors while Bulletin G170 contains data of interest to design and production engineers—*A-P Controls Corp., Dept. AA, 2450 N. 32nd St., Milwaukee 45.*

Metal Cutting Jig Saw

MANUAL describes "Bayonet Saw" portable electric jig saw and explains how to use it in sawing aluminum extrusion, galvanized sheet metal and flat or bar steel. The saw features orbital blade action designed to insure efficient cutting and lengthen blade life—*Porter-Cable Machine Co., Dept. AA, 75 Exchange St., Syracuse 8, N. Y.*

Cooling Towers

PACKAGED COOLING TOWERS featuring "take-a-part" construction are described in a 12 page illustrated catalog. Specifications, dimensions, capacity tables and engineering data are included as well as illustrations of typical installations. Models available include



"See you got through your job early. You must use Buckeye, too."

"Sure do — and have you noticed how much more time we have for selling, thanks to time-saving Buckeye Prefab Pipe Fittings?"

BUCKEYE Standardized Prefab Pipe and Fittings

- ★ Eliminate shop time so you can see more prospects and sell more jobs.
- ★ One man can make 12-foot pipe lengths by grouping Buckeye Snap-Tite 5' and 2' sizes.
- ★ All Buckeye pipe and fittings are packed in sturdy, clearly marked cartons.
- ★ Buckeye Standardized Pipe and Fittings are sold by leading wholesalers.

SAVE TIME!

BUILD SALES
BUY BUCKEYE!



BUCKEYE
FURNACE PIPE COMPANY
897 Ingleside Columbus 8, Ohio



Your key to winter heating

Install the new CAD
AIR CONDITIONER
FURNACE and inex-
pensive **EVAPORATOR**
CABINET now.

Add evaporator and
condensing unit now,
or later. It's a com-
plete, flexible heating-
cooling package —
designed to give you
and your customers
true air conditioning
performance at a
truly sensible price.
16 models — 60,000
to 120,000 B.t.u. input
— 1000 to 2200 CFM.
Upflow furnace shown
— also available in
counterflo models.



WESTERN and ATLAS are brand names for heating and air conditioning equip-
ment manufactured exclusively by International Sales Company — pioneers
of forced air heating. Since 1908.

Western
FURNACES
AIR CONDITIONERS

FIRST IN
FORCED
AIR

INTERNATIONAL
SALES COMPANY
MANUFACTURERS
San Francisco 24,
California

ATLAS
FURNACES
AIR CONDITIONERS

new literature

(Continued)

vertical and horizontal induced draft types as well as
redwood and all steel natural draft towers—*Dover Mfg.*
Co., Dept. AA, 3117 Weatherford Ave., Independence,
Mo.

Air Meters

CATALOG No. 136 contains descriptive data and prices
for three models of air meters—Model G, which fits
the hand and is designed for use in usually inaccessible
areas; Model H for field and laboratory use; and
Model B precision meter for measurement of highest
accuracy—*Hastings-Raydist, Inc., Dept. AA, Newcomb*
Ave., Hampton, Va.

Fractional and Integral HP Motors

CONDENSED CATALOG presents specifications and prices
of general purpose fractional and integral hp motors.
Featured is a cross reference chart for NEMA "old"
and NEMA "new" rerated frames. Tables and keyed
diagrams give dimensional information. Also included
is a list of the company's district offices—*Marathon*
Electric Mfg. Corp., Dept. AA, Cherry & Randolph
Sts., Wausau, Wis.

Combustion Efficiency Test Kit

No. 1100 COMBUSTION TEST KIT is described in
Bulletin No. G-20 (four pages). The kit contains all
the equipment necessary for testing CO₂ content,
draft, stack temperature and smoke in gas, oil or coal
fired installations. Dimensions are 10¾ × 9 × 4½
in.—*F. W. Dwyer Mfg. Co., Dept. AAC, P. O. Box*
373, Michigan City, Ind.

"Type B" Gas Vents

"TYPE B" gas vents which can be used instead of
masonry chimneys in homes that are going to be heat-
ed by gas are covered in a pamphlet prepared by a
group of vent pipe manufacturers who are members
of the Gas Appliance Manufacturers Association.
Directed toward the builder, the pamphlet points out
that the specially designed vents permit construction
economies as well as increased operating efficiency—
Type B Gas Vent Pipe Manufacturers, Gas Appliance
Manufacturers Association, Dept. AA, 60 E. 42nd St.,
New York 17.

Gas Heating Equipment

GAS-FIRED HEATING EQUIPMENT is illustrated and des-
cribed in catalog GN-56 (24 pages). Equipment shown
includes suspended gas unit heaters, both fan and
blower types, in capacities from 25,000 to 250,000

new literature

(Continued)

Btu; two series of duct furnaces, with capacities from 50,000 to several million Btu; and "PAC" horizontal furnaces in sizes from 50,000 to 125,000 Btu—*Reznor Mfg. Co., Dept. AA Mercer, Pa.*

Electrodes

BULLETIN GED-3048 gives features, deposition rates, and properties of "Strikeasy" LH-1 and LH-2 low-hydrogen, powdered-metal electrodes—*General Electric Co., Dept. AA, Schenectady 5, N. Y.*

V-Belt Drives

TIPS TO HELP USERS of V-belt drives diagnose many of the common causes of trouble in their drives are presented in three self-mailers which may be tacked on the wall or attached to the machinery itself for reference. Mailer No. 1 (V-1400-M39P) tells how to keep V-belt drive delivering maximum rpm. Mailer No. 2 (V-1400-M38P) explores the subject of V-belt drives using "QD" (quick detachable) sheaves and points out how to select proper drives; install drives and belts; keep sheaves in good shape; adjust belts; check motor and drive shaft for alignment. Mailer No. 3 (V-1400-M40P) illustrates symptoms of V-belt failures and gives diagnoses and cures for various kinds of V-belt troubles—*Worthington Corp., Dept. AA, Harrison, N. Y.*

Centrifugal Fans

REVISED BULLETINS present new features and data on Class I and Class II centrifugal fans. Housings for the fans are smaller which, according to the company, allows for installation of the equipment in 3 to 5 percent less space than previously possible. Also, in fan sizes 12 through 36 in. a new type of all-welded housing support is used. Address requests on company letterheads for bulletin DS-348B (backward inclined blades) or DS-348F (forward curved blades)—*The Trane Co., Dept. AA, La Crosse, Wis.*

Tools for Sheet Metal Workers

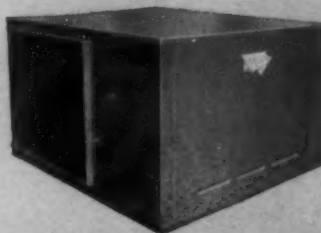
CATALOG describes "SpeedTools" for use in sheet metal and building applications. Included are photographs and specifications for drills, grinders, saws, sanders and polishers—*SpeedWay Mfg. Div., Thor Power Tool Co., Dept. AA, Aurora, Ill.*

Standards for Mechanical Air Filters

COMMERCIAL STANDARD provides a gravimetric test method, using synthetic dust, for evaluating the performance of unit type mechanical air filters. It also presents a method of making uniform performance



... and Summer cooling



NEW 2 AND 3 H. P. CONDENSING UNITS

Designed and engineered for operation with CAD Air Conditioner Furnaces. Air or water cooled. Standard and de-luxe models. Modern steel cabinets.



NEW 2 AND 3-TON EVAPORATOR ASSEMBLIES

Cabinets match CAD Air Conditioner Furnaces. Upflow, counterflow and horizontal flow evaporators. Cabinets available separately for installation in duct now, insertion of evaporator later.



PRE-CHARGED TUBING WITH BREAKAWAY VALVES

Available in 25 or 50-foot lengths, pre-charged with Freon-22. Safe, positive hookup of condenser and evaporator — no field-soldered connections necessary.

Send for your free copy of WESTERN or ATLAS 1956 Condensed Catalog. Detailed specifications and installation data for more than 100 models and sizes of gas and oil-fired heating equipment, and air conditioning.

Western

FIRST IN FORCED AIR

ATLAS

INTERNATIONAL SALES CO. • MFGRS.
2045 Evans Ave., San Francisco 24, Calif.

Please send me your new ATLAS _____ WESTERN _____
1956 Condensed Catalog: (check one)

NAME _____

ADDRESS _____

CITY _____ STATE _____

FREE!



NEW RADIANT direct oil fired WATER HEATERS...

GLASS-LINED... model GL-30

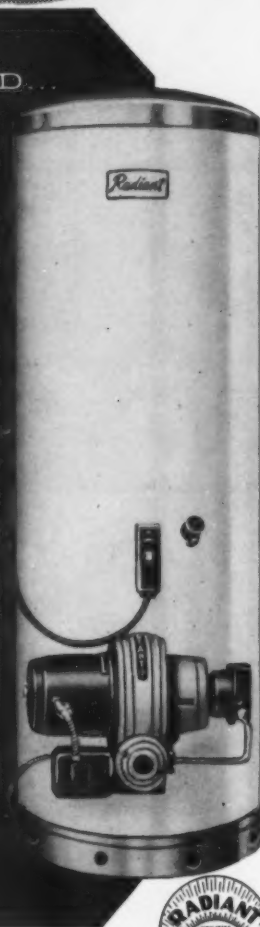
FOR HOTTER WATER—
CLEANER, FASTER!

- ◀ Glass-lined boiler-plate steel tank will withstand Hydrostatic pressure of 300 lbs. psi.
- ◀ Heavy-duty Fibreglas insulation prevents heat loss.
- ◀ Magnesium anode assures rust-free water.

COPPER... model CP-30

FOR MAXIMUM EFFICIENCY—
LONGER LIFE!

- ◀ Features solid copper tank encased in heavy-gauge high strength steel to withstand Hydrostatic test pressure of 525 lbs. psi.
- ◀ Cleaner water assured... always flows through Never-Rust copper.
- ◀ No heat loss — heavy Fibreglas insulation completely covers the tank.



STYLED FOR STREAMLINED GOOD LOOKS!

You'll like the attractive baked enamel finish and smart custom styling of both new Radiant hot water heaters. They blend with the decor of modern kitchens and recreation rooms.

LOWER COST HOT WATER!

Both new Radiant hot water heaters are equipped with famous Radiant Oil Burners for efficient oil firing... for heating water at lower cost.

Write for complete literature on all Radiant products.

RADIANT UTILITIES CORP.

8817 18th Ave., Brooklyn 14, N. Y.

new literature

(Continued)

reports of the results of tests. Ask for recommended commercial standard TS-5315—H. A. Bonnet, Commodity Standards Div., U.S. Department of Commerce, Washington 25, D. C.

Oil Burner Filter Refills

FOLDER illustrates and describes models PF-200, PF-63, PF-67 and PF-65 oil burner filter refills. On the reverse side of the folder is a cross reference chart showing the various filters available, replacement elements and the interchangeability of such elements—Purolator Products, Inc., Dept. AA, 970 New Brunswick Ave., Rahway, N. J.

Welding Equipment

BUYERS' GUIDE for welding equipment (GEC-1033, 20 pages) includes data on a-c and d-c general purpose and industrial welders, semi-automatic and automatic equipment, and carbon block brazing equipment. Ratings, dimensions and specifications are given for all equipment as well as descriptions and analyses for electrodes—General Electric Co., Dept. AA, Schenectady 5, N. Y.

Mild Steel Electrodes

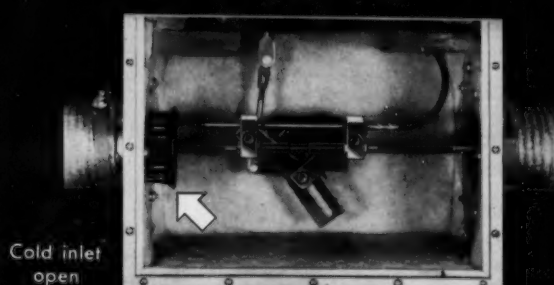
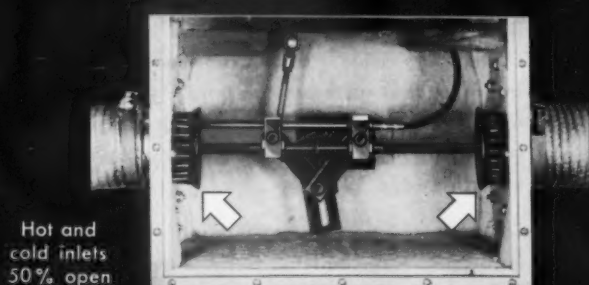
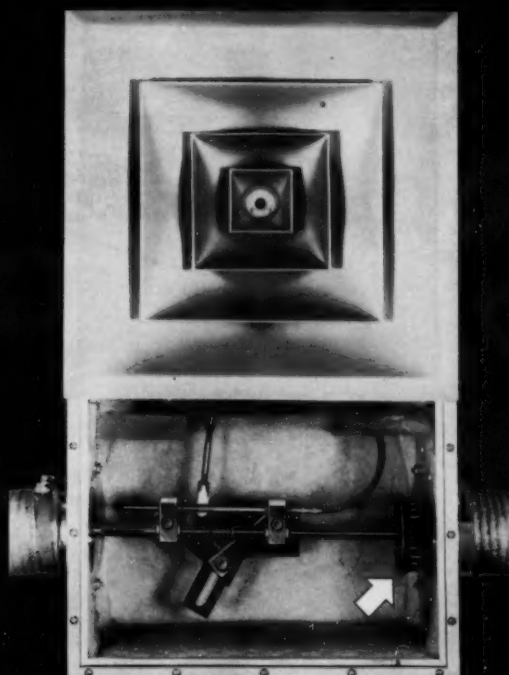
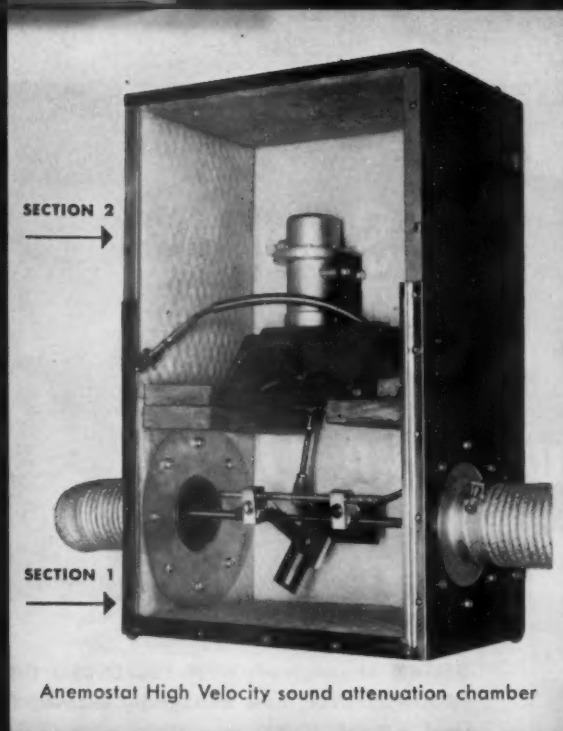
BULLETIN SB-1351, Weldirectory for Mild Steel and Low-Alloy High-Tensile Steels, has been revised to include data on new iron powder and other electrodes. The bulletin provides a description of each electrode and lists its physical properties and chemical composition. Included are recommended welding procedures, an operator's reference table and a list of typical applications for each electrode—The Lincoln Electric Co., Dept. AA, 22801 St. Clair Ave., Cleveland 17.

Registers and Grilles

REGISTER AND GRILLE CATALOG features new "Alum-tint" wall models available in a range of colors designed to blend with various styles of interior decoration. Other products described include bar and blade type registers and grilles; floor registers and grilles; ornamental design perforated grilles; and plain lattice registers and grilles. Performance tables, ordering information and installation procedures are included. Ask for Catalog No. 28—Register & Grille Mfg. Co., Inc., Dept. AA, 70 Berry St., Brooklyn 11.

Combustion Chambers and Refractories

VERTICAL AND RECTANGULAR models of precast combustion chambers are described in a four page illustrated circular. Vertical types range in heights from



How to mix and diffuse high velocity air automatically

The Anemostat High Velocity sound attenuation chamber is divided into two sections. Both hot and cold air from the main risers enter Section 1, which is an acoustically lined blending chamber, in which the volumes of air are controlled by the Anemostat serrated rocket-socket valves. When the thermostat is set, the rocket-socket valves move slowly back and forth, thereby adjusting the volume of air supplied through the hot and cold inlets. The velocity of the air which enters Section 1, at from 3500 to 6000 fpm, is automatically reduced by expansion.

As the blended air meets the temperature

requirements of the thermostat, it passes through a baffle arrangement into the acoustically lined Section 2 of the chamber, further reducing the db rating of the air.

The air then passes through the Anemostat Air Diffusers, where the aspiration effect causes mixing of room and supply air within the diffuser, resulting in further temperature equalization. The diffuser then delivers to the occupants of the room draft-free air at the desired temperature.

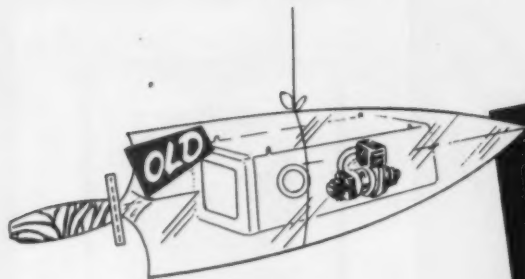
The Anemostat All-Air High Velocity distribution system offers other important advantages. It can be used with smaller

than conventional ducts. It can be installed faster and at less cost. It requires no coils, thus eliminates leakage, clogging and odors. Furthermore, Anemostat round, square and straightline diffusers with high velocity units blend into a wide variety of architectural designs.

Write for 1956 New Products Bulletin and Selection Manual 50 to Anemostat Corporation of America, 10 E. 39 Street, New York 16, N. Y.

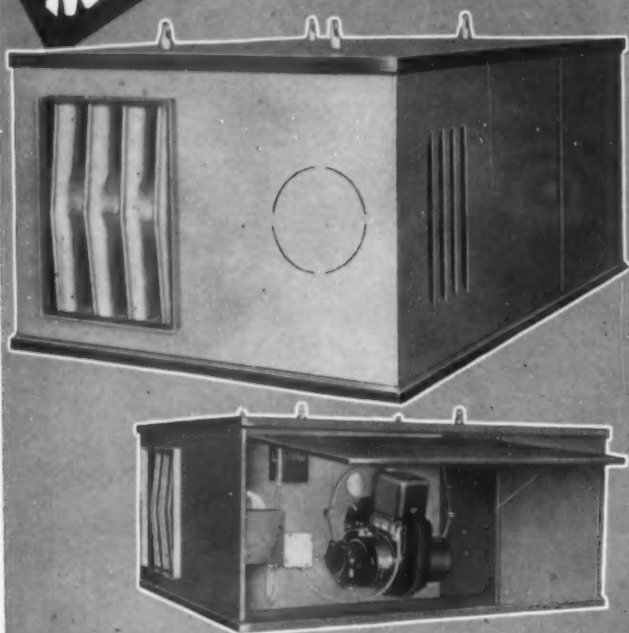
Anemostat: The Pioneer of All-Air High Velocity Systems





No Sword of Damocles with the Delta!

NEW



Remember!

THE ALL-NEW DELTA HEAT EXCHANGER OFFERS
MORE RADIATION SURFACE THAN ALMOST ANY
FURNACE AVAILABLE TODAY!

DELTA HEATING CORPORATION Dept. A, Trenton 8, New Jersey

Gentlemen: I'm interested. Delta's new oil-fired suspended furnace sounds great! Now prove it to me. No obligation, of course.

Name _____ (Please Print)
Company _____
Street _____ Zone _____ State _____
City _____

DELTA'S streamlined, NEW SUSPENDED OIL-FIRED FURNACE, now beautifully encased in steel, not only LOOKS safer than conventional suspendeds, it IS safer!

No, there's no 'eavy, 'eavy over my 'ead with DELTA's NEW SUSPENDED MODEL. It's Delta's challenging answer to a recent survey which indicated that customers, despite high heating bills, preferred suspended gas furnaces because they feared to walk beneath suspended oil furnaces.

Truly one of America's most beautiful suspended oil furnaces, the NEW Delta is available in 6 sizes, from 68,000 to 210,000 BTU/HR. It is designed to fit the narrowest "crawl spaces" and the widest range of commercial buildings — from candy stores to airplane hangars.

See this DELTA for yourself — you'll agree it is the leading suspended furnace on the market today!

Price? We beat 'em all!

Are you from Missouri — want more proof? OKAY! Fill in this handy coupon. We'll take it from there!



Delta

HEATING CORPORATION

TRENTON 8

NEW JERSEY

14 to 18 in; rectangular models are available in 12½, 14½ and 18 in. widths. All are designed to be quickly assembled without tools or cements. Also described are "Fireline" refractories for forming burner and stoker hearths, for repairing broken or cracked firepots, etc.—*Insul-Lyte Corp., Div. of Plübrico Co., Dept. AA, 130 W. Pleasant, River Rouge 18, Mich.*

Reinforced Plastics

BULLETIN 56 covers "Polyglas" reinforced plastics for applications involving corrosive chemicals and fumes. Typical applications include ductwork, exhaust hoods, ventilating system components, fan housings, etc. The company, working to specification, fabricates the various parts of the required product in sections designed for easy assembly. The sections can be welded together with resin and glass fiber wrapping or they can be equipped with metal flanges for bolting together—*Modular Plastic Corp., Dept. AA, 1635 Westminster, Detroit 11.*

High-Velocity Air Distribution

HIGH-VELOCITY AIR DISTRIBUTION (30 pages, \$1.50) is a collection of papers presented at a symposium held at the recent 62nd annual meeting of the American Society of Heating and Air-Conditioning Engineers. Included are discussions on duct design; duct fabrication and construction; influence of velocity on costs; methods of field testing for tightness and air flow; and problems of noise in high velocity engineering. Much of the text originally appeared in the Journal Section of Heating, Piping & Air Conditioning—*American Society of Heating and Air-Conditioning Engineers, Dept. AA, 62 Worth St., New York 13.*

High Efficiency Space Filters

"M-S-A ULTRA-AIRE" space filter featuring non-combustible glass fiber web filter media said to provide initial filtration efficiency of 99.97 percent is described in bulletin No. 1505-3. The filter is designed for use in hospitals and research laboratories and in other applications where exceptionally clean air is required. Data is given on construction, installation, testing and performance—*Mine Safety Appliances Co., Dept. AA, 201 N. Braddock Ave., Pittsburgh 8, Pa.*

Heating, Air Conditioning Supplies

WHOLESALE BUYERS' GUIDE No. 56 (112 pages) lists parts and equipment for heating and air conditioning applications. Included are belts, coils, condensing units, controls, fittings, gages, motors, tools, valves and many others—*Airo Supply Co., Inc., Dept. AA, 2732 N. Ashland Ave., Chicago 14.*

save TIME and LABOR



USE WIREMOLD FLEXIBLE AIR DUCT on all air conditioning jobs!

Sheet metal contractors *everywhere* agree that Wiremold Air Duct is *easier* and *faster* to install, saves time and labor and results in *more profitable* air conditioning installations. *Extremely* flexible and durable, Wiremold Flexible Air Duct bends easily around obstructions without kinking, allows for expansion and contraction of the system, and prevents transmission of mechanical vibration.

Wiremold Air Duct can be installed with minimum waste — short lengths are easily spliced on the job. Write for instruction sheets.

There are Wiremold representatives in cities throughout the United States, Canada and Cuba.



The WIREMOLD Company

HARTFORD 10, CONNECTICUT

we hear that . . .

► **JOSEPH T. RYERSON & SON, INC.** recently entertained some 12,000 visitors during a three day open house celebration held at the company's steel service plant, Ogden Ave. and Rockwell St., Chicago. Customers of the company, representatives of other steel companies, suppliers, business and civic leaders visited the plant during the first two days, while on the third day, employees and neighbors and their families had an opportunity to tour the premises. The two hour tour took visitors through three units of the company's property — the north, center and south warehouses. Following the tour, guests were served dinner in a 90 × 422 ft dining tent accommodating 2000 persons at one sitting.

► **BETHLEHEM FOUNDRY & MACHINE CO.** is celebrating its 100th anniversary this year. Products manufactured by the company in its early years included such equipment as hitching posts, iron stairways, elevator enclosures and heavy castings. Since that time, it has branched out into many fields, beginning in 1932 the manufacture of domestic oil burning equipment. During World War II, for its outstanding work in the war effort, the company received five

Army-Navy "E" awards. Officers are George A. Taylor, president; Ernest H. Dimler and Robert W. Fluck, vice presidents; and Willard H. Moyer, secretary-treasurer.

► **FOUR HUNDRED AND SEVENTEEN** service men and gas utility engineers have been trained in installation and servicing of the Coleman Co.'s gas motor air conditioning unit at seven regional training schools. Clifford E. Hall, utility operations manager for the company, explained that the purpose of the schools was "to provide a strong nucleus of trained installers and service men upon which we can develop in the future as production of the gas motor unit expands." A second series of schools will be conducted next year.

► **FREEMAN STOKER DIV.** of Illinois Iron & Bolt Co. has purchased the stoker business of the Combustioneer Div., Steel Products Engineering Co. The Freeman Div. will continue to supply the trade with Combustioneer stokers and replacement parts.

► **BRYANT DIV., Carrier Corp.** recently concluded a series of "Nuts & Bolts" application and service meetings for air conditioning dealers. At each session air conditioning equipment was set up, operated and checked out. Over a two month period, Charles Eskew,

Specify EXCELSIOR



DIVERTERS

for Gas Heat Installations

These Excelsior diverters will meet your requirements for any gas heat installation, available in size 3" to 10". The A.G.A. mark is embossed on each diverter. Sold by leading wholesalers everywhere.

NEW CATALOG NO. 10

New catalog gives details and prices on Excelsior complete line of Standardized Pipe, Ducts, and Fittings sent on request.

THE EXCELSIOR STEEL FURNACE COMPANY

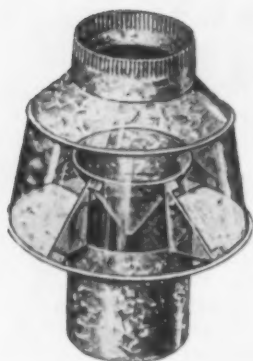
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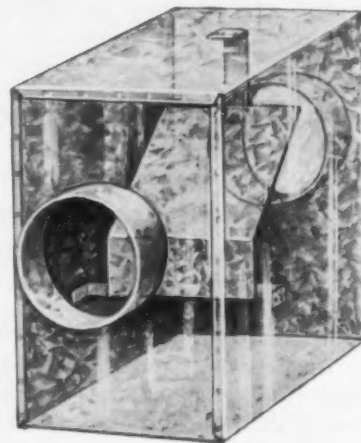
Chicago 6, Ill.

EXCELSIOR HEATING & SUPPLY DIV.
The Excelsior Steel Furnace Company
879 Hersey Ave., St. Paul 14, Minn.
Telephone: MI dway 6-7235

EXCELSIOR HEATING SUPPLY DIV.
The Excelsior Steel Furnace Company
2 East 3rd St., Kansas City 6, Mo.
Telephone: VI ctor 2-3715



No. 753 Vertical Diverter
A.G.A. Listed



No. 754 Horizontal Box Diverter
A.G.A. Listed

Note

New

Address

Formerly — 118 S.
Clinton St.





Jobs like this are better with Bethcon

They're readying some ductwork for the ventilating system of a new auditorium. Those units were fabricated from Bethcon galvanized sheet steel, which gives them an edge over similar sheet-metal ducts of only two or three years ago.

That edge stems from the fact that Bethcon is Bethlehem's *continuously* galvanized sheet. Bethlehem's continuous galvanizing imparts certain improvements to the sheet, which in turn make for better sheet-metal jobs.

Chief advantage of Bethcon is the superior bond between zinc coating and base metal. This lets you put Bethcon sheets through severe forming processes—even to bending it double—without cracking or peeling of the zinc.

The coating is more uniform, too, both in thickness and

in appearance. The center and ends of Bethcon sheets all get equal coating weight and equal protection, and there is no bead along the drip end. Spangles are brighter and more attractive.

You can get Bethcon in cut sheets or coiled strip, 14-gage or lighter. Either plain carbon or corrosion-resisting Beth-Cu-Loy (copper-bearing steel) can be used for the base metal, depending on your requirements. For further information, just put in a call or write a note to the Bethlehem district sales office nearest you.

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. Export Distributor: Bethlehem Steel Export Corporation

BETHLEHEM STEEL



**Which
TYPE*
Do YOU Prefer?**



FLEXI-DUCT VIBRA-STOP

***Grant Wilson**
FLEXIBLE DUCT CONNECTIONS

Stop system noise on Heating, Ventilating and Air Conditioning installations. Isolate mechanical rattles, starting vibrations, "on and off" cycle sounds, shaft whine, fan hum, etc. at their source. Apply either of the Grant Wilson Flexible Duct Connections between blower or plenum and furnace casing, between take-offs and main or branches . . . the resultant quietness of system operation satisfies customers, leads to more jobs, without call-backs.

FLEXI-DUCT . . .

Grant Wilson's Woven Asbestos Flexible Tape. *The choice of those who want rock-bottom economy combined with top efficiency.* Handy 50 foot rolls, 6 inches wide, and 150 foot rolls, 8 in. wide, both with selvaged edges. Can be taped or bolted to equipment or duct work.



FLEXI-DUCT lifts out of carton for easy use.

VIBRA-STOP . . .

Asbestos or Canvas, 4" wide, factory seal to 4" No. 1 Prime Galvanized Metal on one side, 3" on the other. *Preferred by those who want the quickest, easiest installation.* 25, 50 and 100 foot rolls in handy, individual size "roll out" cartons.

Asbestos used is Underwriters' grade and meets Federal specs. MIL-C-4177. Canvas, also Underwriters' grade, meets Federal specs. MIL-D-10860.

Write today for full information, FREE samples and prices — ask for Bulletin 756-AA.



VIBRA-STOP comes in handy "roll out" cartons.

Grant Wilson inc.

ASBESTOS and INSULATING MATERIALS

141 WEST JACKSON BLVD. • CHICAGO 4, ILLINOIS

we hear that

(Continued)

sales manager for cooling equipment, held over 31 meetings and talked to 628 dealers.

The division has begun construction of an administration and engineering research building at its national headquarters in Indianapolis. The new building is scheduled for completion by August 31.



REPRESENTATIVES discuss new models of furnaces and air conditioners introduced by International Sales Co. at bi-annual sales conference

► SALES REPRESENTATIVES of International Sales Co. gathered recently in San Francisco to preview the company's 1956 lines of "Western" and "Atlas" furnaces and air conditioners. The five day meeting was conducted by company officials including Jim Tuck, president; Jim Deane and C. E. Larson, vice presidents; and Bill Steiner, sales manager. To familiarize local dealers with the company's expanded line, a series of conferences are being conducted by field representatives and wholesalers in their respective territories.

► MORE THAN 100 HEAT PUMP dealers and power company executives from all parts of the country were in attendance at the recent three-day conference sponsored by the Typhoon Heat Pump Co. Subjects discussed included residential heat gain and heat loss, duct design, types of heat pump systems, and cost estimating on heat pump installations. New equipment was introduced including models ranging in size from 2½ to 7½ hp.

► WORTHINGTON CORP.'s five regional sales managers recently attended a five day sales conference held at the firm's headquarters at Harrison, N. J. The managers are A. W. Fraser, midwest; J. V. Jirasek, southwest; H. W. King, western; J. B. Laramy, eastern; and C. S. Wentworth, central. Special emphasis was given to sales policy and procedures of the company's recently established decentralized divisional system of organization. Under this system, the general

Unmatched Economy + Whisper-Quiet Operation
= Easy, Profitable Sales



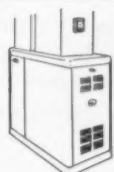
with
TORIDHEET



TORIDHEET

Rotary Wall Flame Oil Burners

**Power These
Fuel-Thrifty
Units**



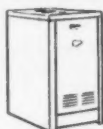
Model ORA
Winter Air-Conditioner



Model ORD
Counterflow



Model ORA
Hi-Boy



Model ORU
Boiler



Model ORM
Water Heater

You make useful friends out of customers when you sell time-tested TORIDHEET Rotary Wall-Flame equipment. The operation is so reliable and quiet, the fuel economy so great, that customers tell friends and neighbors—actually become part-time salesmen for you.

Proved fuel savings up to 40% and trouble-free operation (only 1 moving part) make TORIDHEET a profitable line for you

to sell—a profitable line for your customers to buy. If you're not selling TORIDHEET you're missing a bet!

COMPLETE UNITS AND CONVERSION BURNERS—OIL OR GAS

Wall-Flame Oil Burners • Gun Burners • Wall Flame Boilers • Furnaces and Water Heaters
Gun Fired Boilers and Furnaces • Gas Conversion Burners and Gas Fired Furnaces
Low-Boys • Hi-Boys • Counterflows • Comfort Cooling Equipment

**SOME DESIRABLE DEALER FRANCHISES AVAILABLE—
YOUR INQUIRY IS INVITED**

CLEVELAND
Toridheet
AUTOMATIC HEATING

Toridheet Division
CLEVELAND STEEL PRODUCTS
CORPORATION

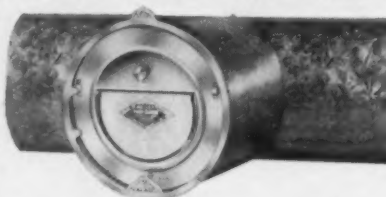
16035 Brookpark Road • Cleveland 11, Ohio

Affiliated Canadian Manufacturer: Aero Tool Works Limited, Toronto, Ontario

WALKER

ROYAL PURPLE MODEL

Only
**AUTOMATIC
DRAFT
CONTROL**



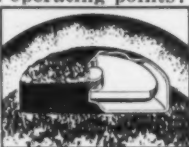
**That's Absolutely Impregnable
To Soot, Carbon Corrosion, Dust!**

Here it is—an automatic draft control that maintains its super sensitivity and gives perfect, trouble-free performance for years even under the most adverse operating conditions. Masterfully engineered for complete protection at all vital operating points:

1. Weight adjustment assembly sealed by protective housing to keep mechanism absolutely free from dirt, corrosion.

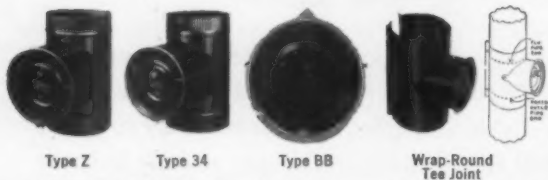


2. Pivot pins controlling vane movement are on face of damper set back away from edge. Box-type hinges seal delicate knife-edge pivots against dirt.



Can't be copied or duplicated—patents pending. For complete information, see your jobber or write Walker Manufacturing and Sales Corporation, world's leader in draft controls for 30 years.

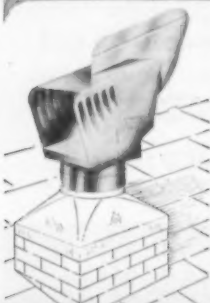
**Look to Walker for a Complete Line
of Automatic Draft Regulators**



• Over 20,000,000 Now in Use! • Draft regulators for oil, coal and gas installations • Draft inducers • Gravity roof ventilators

VENTURI-TOP CHIMNEY CAP

Another Outstanding Walker Product



For heating (gas, oil or coal) and ventilating. Directional vane keeps throat facing wind. Sloping-throat prevents back drafts, constricts air flow over chimney opening for maximum draft effectiveness. Unit rotates on friction-free, hardened-steel ball bearing. Hardened-steel pivot. Ring guide bearing in pivot post prevents sagging or leaning.

WALKER MFG. & SALES CORP.

1730 Penn Street

St. Joseph, Mo.

we hear that

(Continued)

manager of each operating division now has full responsibility for the operation of his segment of the firm's business.

► FRANK KOVICH has been appointed general manager of the Milwaukee Valve Co., a subsidiary of Controls Corp. of America. Mr. Kovich is also vice president of Controls Corp. of America and the director of manufacturing of the A-P Controls Div.

► BUILDING of some 1200 homes featuring Carrier "Weathermaker" summer and winter units recently began in the Bayberry project, near Syracuse. Year 'round air conditioning will be a standard feature of the "Brentwood" model, largest of the four different types of homes to be constructed. All other homes are equipped so that buyers may obtain complete air conditioning at the time of purchase or add cooling later.

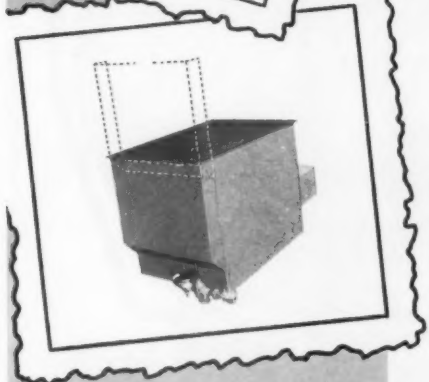
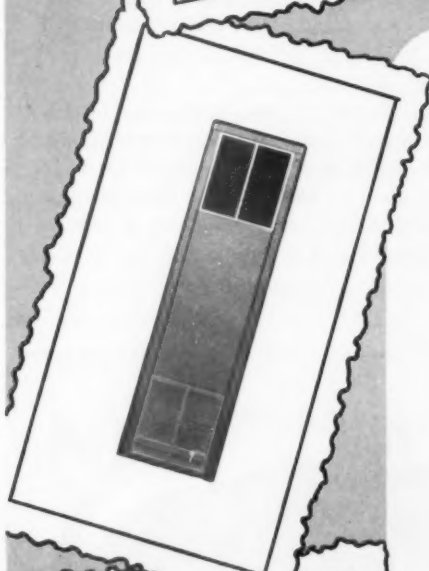
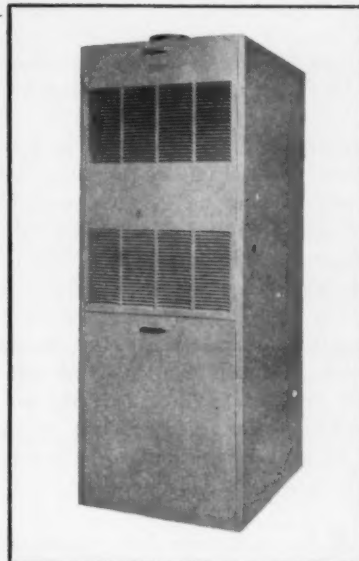
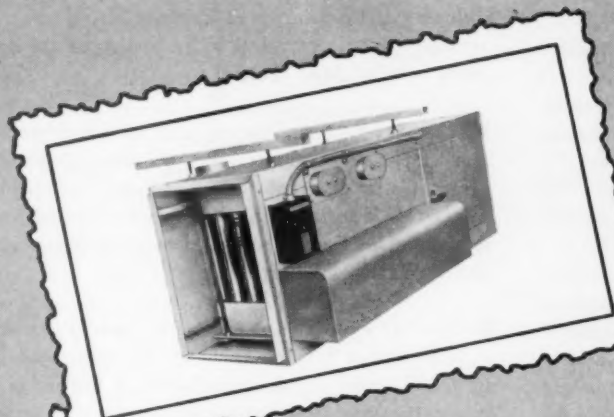
Twenty-eight residential specialists and branch managers from the firm's offices throughout the country recently attended a conference in Syracuse to learn about the "Winter Weathermaker" furnace which has provision for year 'round air conditioning. Following the five day conference, the delegates returned to their field offices to pass along sales and engineering techniques to distributors and dealers in their areas.

► CRUCIBLE STEEL Co. of America recently played host to over 400 Texas businessmen and industrialists at the official opening of its new sales office and warehouse building located at 7901 Sovereign Row, Dallas. The new warehouse will carry a complete stock of the company's stainless, alloy, tool and high speed steels and will serve customers in Dallas and northeast Texas. William Ross Cummings is in charge of the new operation.

► UNEXPECTED SPEAKER at Mueller Climatrol's recent Wisconsin dealer meeting was U. S. Senator Alexander Wiley. The senator addressed the group at the request of John Reock, Mueller advertising manager. Other speakers covered financing, sales promotion, installation and servicing of the company's equipment.

► ROBERT M. WOLAVER, design engineer at Viking Air Products Div. of National U.S. Radiator Corp., has been appointed a member of the American Society of Industrial Designers. The society is a national honorary organization established to further the profession and practice of industrial design.

► ROBERT S. INGERSOLL was recently elected president of Borg-Warner Corp. Roy C. Ingersoll, formerly chairman of the board and president, was re-elected



A **COZY** Picture FOR MORE FURNACE SALES

Picture yourself enjoying greater profits with less personal effort. That's what happens when you handle the **COZY** line of gas-fired furnaces, designed to handle over 90% of all home and small building heating problems. For more than 25 years this company has taken pride in manufacturing quality products and in establishing good relationships among manufacturer-distributor-dealer and customer, *NOW*, IT'S YOUR TURN TO GET INTO THE PICTURE. Ask for complete details of the year-round, high-profit sales plan. **WRITE TODAY!**

COZY FORCED AIR FURNACE is available in up-flow or counterflow models, with horizontal styles for attic, utility room, or under-floor installation. **COZY CHALLENGER FLOOR FURNACE** has accessible controls. Wall heaters for dual- or single-wall installation.



The ADVANCE FURNACE CO.
WICHITA, KANSAS

COZY

board chairman and was named chief executive officer. Lester G. Porter was elected executive vice president.

▶ TWO DISTRICT SALES OFFICES of Penn Controls, Inc. recently moved into new quarters. The Berkeley, Calif. office, under the supervision of Marechal N. Duncan, is now located at 2729 San Pablo Ave. The new Milwaukee office is at 1351 W. North Ave. Harold D. Gray is district manager.

▶ JOSEPH T. RYERSON & SON, INC., steel warehousing subsidiary of Inland Steel Co., recently purchased property in Indianapolis, Ind. as the site for a new steel service plant. The new plant, to cost approximately \$1 million, is planned to be in operation early in 1957.

▶ W. H. BLACKBURN has been elected vice president of the Peck, Stow & Wilcox Co.

▶ THE BOARD OF DIRECTORS of Wagner Electric Corp. has elected J. H. Devor president and G. W. Brown and H. N. Felton vice presidents. E. G. Holtzman was elected secretary-treasurer.

▶ DELMAR MOERICK, vice president, sales, A-P Controls Div. of the Controls Corp. of America, was recently elected to the board of directors of the Air-Conditioning and Refrigeration Institute. Mr. Moerick will represent the Flow Control Valve Section on the board for a term of three years.

▶ SEVENTY-FIVE engineering and service department men employed by dealers attended the Iron Fireman Mfg. Co.'s factory engineering training school held recently in Cleveland. Subjects covered included installation and servicing methods, proper sizing, startup, and adjustment of burners.

▶ CENTURY ENGINEERING CORP. has recently completed a laboratory at Cedar Rapids where cooling coils can be tested under varying conditions. A feature of the new laboratory is a wind tunnel in which temperature, moisture content and quantity of air discharged are measured.

▶ THE AIR CONDITIONING DIV. of Servel, Inc. has extended the warranty period of refrigeration units in "All-Year" air conditioners from five to 10 years. In addition to the extended warranty, the division offers a labor allowance to cover the average cost of unit replacement for the 10 year period.

**In the New York market
...where price is
an important factor ...
and rigid building
codes exist...
Empire Ventilators
outsell all others.**



Sold thru
leading
wholesalers.
See your
jobber.

Empire Ventilation Equip. Co.

**35-39 Vernon Boulevard
Long Island City 6, N. Y.**

wholesaler doings...

► **FRANK J. KERSCHER Co.**, Manitowoc, Wis. wholesaler, has secured the services of Harold Jahaske, a former sheet metal contractor of Lombard, Ill. Mr. Jahaske, with more than 25 years of experience in the field, will work with contractors who need help on special sheet metal problems. He has been on the Apprenticeship Board Local 265 Sheet Metal Union for a number of years, is a member of the National Warm Air Heating and Air Conditioning Association and is also a member of the Sheet Metal Contractors' Association of Illinois.

► **ABSORPTION COOLING & HEATING**, Chicago has been named a distributor of air conditioning equipment by the United States Air Conditioning Corp.

► **T. KING MCCREERY, INC.**, 568 S. Aiken, Pittsburgh, Pa. has been appointed a wholesaler of heat pumps by the General Electric Co.'s Weathertron Dept. The firm will distribute heat pumps in certain counties of Pennsylvania, West Virginia and New York.

► **NINE FIRMS** in southern California have been appointed installing distributors for Servel "All-Year" gas air conditioning equipment. They are Russell

Heating & Air Conditioning Co., Van Nuys; B. V. Ezell Co., Corona; Marvin D. Shafer Co., Inc., Los Angeles; Don C. Glenn Heating & Air Conditioning Co., Glendale; Gough Bros. Heating Co., Pasadena; Wright's Sheet Metal Mfg. Co., Colton; Allied Air Conditioning Co., Pomona; J. M. Connell Co., Inc., Palm Springs; and Cliff Gentry Sheet Metal & Refrigeration, Indio.

► **DIETL AND KRAFT, INC.**, 455 W. Market St., Newark has taken on the Gibson Refrigerator Co.'s line of residential heating and air conditioning equipment. Dietl and Kraft will serve as distributors in Bergen, Essex, Hudson, Morris, Passaic and Union counties in New Jersey.

► **A REPORT** prepared by the Small Business Administration with the cooperation of various wholesale firms notes that owners and managers of all types of wholesaling houses are currently concerned with how to maintain sales volume and still secure commensurate returns. It states that many wholesalers have found that the solution does not lie in granting increasingly large price concessions, but rather in developing tactics designed to meet competition in their own market. The wholesaler may find it possible to improve his position, the report points out, through a careful evaluation of his competitors' efforts, plus a critical

NEW CATALOG

on the entire line of

STANDARDIZED



MAXWELL STEEL COMPANY

P.O. DRAWER 230

FORT WORTH 1, TEXAS



**Pre-Fabricated
DUCT and FITTINGS**

Write for NEW CATALOG today

Company _____

Address _____

City _____ State _____

Purchasing Agent _____

Shipped **COMPLETELY ASSEMBLED**
READY TO INSTALL



ROYAL FURNACE BLOWER

Models with 12" or 10" blower wheel

- Heavy steel bottom, requires no cementing.
- High motor mount, safer in damp basements.
- Large access door, standard-size filters.
- Variable speed drive, easily adjusted.
- Unusually quiet, sturdy construction.
- Beautiful baked-on enamel finish.
- Heavy duty motor, automatic overload protection.

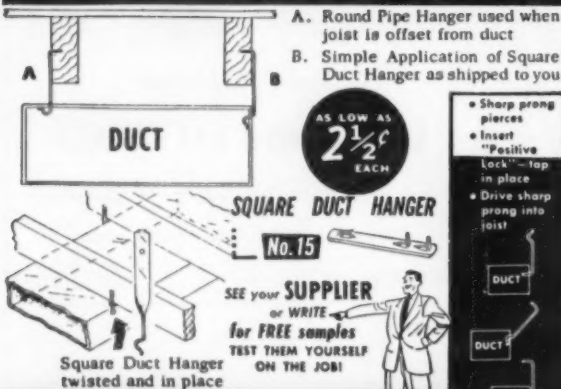
For Prices and details, write

ROYAL PRODUCTS CO.
1406 E. 4th St. Waterloo, Iowa

NEW IMPROVED SQUARE DUCT HANGER

With new "Positive Lock" cam action feature... No Special Tools! Hammer does the Job! Available in six lengths.

PAT. NO. 256,324Z



A. M. HEXDALL CO. Manufacturers of Sheet Metal Specialties
MORRIS, ILLINOIS

wholesaler doings

(Continued)

re-examination of his own objectives and operations. It discusses merchandise, market coverage, service, pricing, advertising and sales promotion as well as costs, warehousing personnel, and controls. Copies of the report (Competitive Tactics for Small Wholesalers, No. 9, Small Marketers Aids) are available free from field offices and Washington headquarters of the Small Business Administration.

► **THE A. H. JOHNSON CO.**, Pittsburgh wholesaler, recently held two sales meetings for dealers in the tri-state area. Oliver J. Deemer and Frank W. Hardt, Jr. of the Johnson company conducted the meetings in cooperation with Jack Irwin, district manager of the Armstrong Furnace Co. and Lou Feeney, Armstrong air conditioning merchandising manager.

► **NATIONAL PLUMBING & HEATING Supply Corp.**, 136 W. Exchange St., Providence, R. I. has been named a distributor by United States Air Conditioning Corp. The new distributor will handle the complete "usAIRco" line, including packaged air conditioners, air and water cooled residential equipment, and "RK" self-contained central air conditioning plants.

► **THE DUBUQUE WHOLESALE BRANCH** of the A. Y. McDonald Mfg. Co. recently held a two day exhibition in commemoration of the McDonald company's 100th year of business. The exhibits were sponsored by 46 of the organizations which supply the firm with heating and summer cooling equipment and other products. According to Alex Watt, Dubuque branch manager, over 600 dealers attended the first show. The second show, open to the general public, drew over 6000 visitors.

► **PROGRESSIVE REFRIGERATION** of 828-830 S. Broad St., Trenton, N. J. has been named to handle distribution of Gibson Refrigerator Co.'s heating and air conditioning equipment in Mercer and Hunterdon counties in New Jersey and in Bucks county in Pennsylvania.

► **ALL WEATHER SUPPLIES** recently celebrated the opening of its new warehouse at 227 E. Indianola Ave., Youngstown, O. On display were Williamson heating and cooling equipment, "Jet-8" gas conversion burners, and Auer registers and grilles. Controls manufacturers whose equipment was on display included Minneapolis-Honeywell Regulator Co.; General Controls Co.; Crise Controls Div., Acro Mfg. Co.; and White-Rodgers Electric Co. The new wholesale operation, headed by Clarence S. Barger, offers its customers complete engineering service as well as heating and cooling controls service.

VITROLINER



VITROLINER CHIMNEYS — The Logical Choice

Vitroliner is not only the first and Pioneer Chimney but still the finest quality-built class "A" Chimney on the market for one and two story homes and buildings using all fuels.

The Architect has flexibility and choice. He can specify 2 types "E" and "L" for ceiling and basement installations—3 Designs, as illustrated above — 5 Diameters (6", 7", 8", 10" and 12") for correct size —UL listed for 4 Fuels—oil, gas, coal and wood.

The Builder prefers lightweight Vitroliner (10 to 15 lbs. per ft.) which is easy to handle and quick to assemble.

The Home Owner enjoys a neat modern design. His Vitroliner adds distinction to the appearance of his home. He also enjoys the safety and long life VITROLINER provides.

Of course, Vitroliner provides complete chimney functions, venting combustion gases from Heating Plant, and Water Heater.

FOR FAST QUOTATION, SEND US "X", "Y" DIMENSIONS AND FLUE DIAMETER.

Investigate this quality chimney write for literature today.

CONDENSATION ENGINEERING CORPORATION
3511 W. POTOMAC AVE., CHICAGO 51, ILL.



"CORRECT PRACTICE in OIL HEATING"

NOW AVAILABLE TO YOU!

A complete reprint of the valuable series

by J. J. Mirabile

This practical series covers every angle of oil burner work, including arrangement of shop . . . stocking of parts . . . record-keeping . . . installation procedures . . . the handling of crews . . . how to make heating surveys . . . how to size combustion chamber . . . how to install thermostat . . . how to start the burner . . . how to use testing instruments . . . and how to operate a service department. It contains, as well, a complete list of causes and cures of oil burner troubles that will serve as a reliable guide in making service calls.

Every shop handling oil burner jobs should own this book. Full size, 8½ by 11 inches — 57 pages of practical helps. Send \$1.00 for a copy to the address below.

KEENEY PUBLISHING COMPANY

6 No. Michigan Avenue

Chicago 2, Ill.

for

SPECIFICATION and BUYING INFORMATION

Use your complete, up-to-date

JANUARY DIRECTORY ISSUE

Your job will be a lot easier if you'll keep the January Directory issue of American Artisan constantly available for handy reference. It's one of your most valuable tools — one which will save you many hours of looking up the products you need for your various jobs. It's the ONE complete, up-to-date, readily accessible source of product information on who makes furnaces, snips, controls, etc., you need — and where they're located. They're identified by trade names, too. EVERY product is listed, alphabetically arranged and printed on a distinctive yellow stock for easy reading and reference.

Keep it handy . . . the time you save with it can be used to advantage in other ways.

NEW IMPROVED Vaporite

Automatic Humidifier



Fits any straight side
warm air furnace

Series 555

Corrosion Resistant
Stainless Steel
Vapor Pan 4" x 15"

ONE SIZE . . . ONE KIT ASSURES LOWEST
COST INSTALLATION AND MINIMUM
INVENTORY EXPENSE

Vaporite No. 555 Humidifier comes completely assembled in one package. No extras to buy . . . no parts to assemble . . . no extra holes to cut . . . no pan leveling or tricky mounting.

NEW IMPROVED VALVE — Provides more positive drip-feed thermostat operation. Water drips fastest when furnace is hottest . . . pan is dry when furnace is cold. Adjustable for precise vaporization needs of each installation.

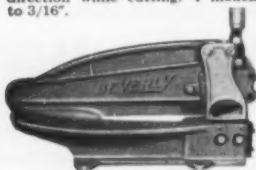
Write for Catalog A-7

AUTOMATIC HUMIDIFIER CO., Cedar Falls, Iowa

Save Time...Labor...Material with BEVERLY metal cutting SHEARS

throatless
SHEARS

Make any cut—straight, irregular, curved. Exclusive design permits turning work any direction while cutting. 4 models—cap. to 3/16".

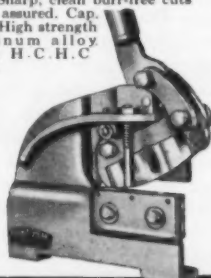


Inside SLOTTER

Makes cuts up to 8" inside edge of sheet. Sharp, clean burr-free cuts always assured. Cap. 16 ga. High strength aluminum alloy body; H.C.H.C. blades.

slitting SHEAR

New "SS" Series—easier cutting with compounded linkage. 3 models—cap. to 1/8"; trimming capacity to 1/4" mild. See your Beverly Distributor. Write for FREE illustrated Bulletin.



Beverly SHEAR MFG. CO.

3020 W. 111th STREET • CHICAGO 43, ILLINOIS

merchandising ideas

► CARRIER CORP. is sending letters to newspaper editors pointing out that now that the hot weather is here, summer air conditioning is of major interest to feminine readers, particularly housewives. The company has prepared a number of news releases designed to be used as items in the women's pages, which explain the numerous advantages of air conditioning. Such benefits as improved dispositions, lower cleaning bills, better appearance, and more time spent at home by the family are among the advantages cited.

► THE MAJESTIC CO., INC. urges its dealers to take advantage of the advertising space provided by uniforms, coveralls, shopcoats, etc. worn by service personnel. The dealer's name and address can be lettered across the back of a jacket or the front of a shirt and this, together with the Majestic emblem, tells prospective customers what is being sold and where it can be purchased. The company points out that this form of advertising is low in initial cost and provides an effective way to reach a large segment of the buying public.

► THE WATERBURY COMPANIES of Minneapolis and St. Paul — retail outlets for Waterman-Waterbury Co. — have developed a merchandising and sales program designed to sell homes featuring Waterbury equipment. According to George Sedgwick, president of the Waterbury Co., "promotion of the promotion" to home builders in the two cities has been decidedly successful. "In one month," he said, "we signed up three times as many new builders to install our furnaces as we had ever before signed up in a comparable period." The program began with the publication of small-space ads in every edition of all Twin City newspapers promoting a "1956 Summertime Guide for New Homes," which was to be published in Saturday newspapers of both Minneapolis and St. Paul. In addition, 65 TV and radio announcements were made promoting the guide and urging readers to save it for immediate and future reference. Following these promotions, the guide appeared in the Saturday papers. It listed all home builders whose houses featured Waterbury equipment and gave details, with illustrations, of more than 100 new homes. Other features of the program include Waterbury signs guiding visitors to display homes and giant balloons which float over every home listed in the guide.

► "WEATHER OR NOT," a five minute sound film for TV advertising is now available to dealers of Lennox Industries, Inc. The movie is a "mixture of heating and summer cooling advertising, a weather forecasting "witch" and some interesting shots of water balloons and recording apparatus.

Now... Quickdraft

PROVIDES LOW-COST INDUSTRIAL
EXHAUSTING WITHOUT MOTOR OR
FAN OBSTRUCTION IN EXHAUST LINE

N-365-QD

★ ELIMINATES DOWN-TIME FOR
CLEANING AND REPLACING FAN
BLADES ★ CUTS MAINTENANCE
COSTS

For venting problems involving
abrasives... corrosive gases...
noxious fumes... high tempera-
tures... moisture... and steam...
Quickdraft offers unequalled
advantages. It does not obstruct
vent line. Its fan and motor oper-
ate in clean or outside air. It does
not require a stack. It cuts instal-
lation and maintenance costs.
Quickdraft is a power draft unit
that also provides the constant
draft required for perfect combus-
tion in heating plants.



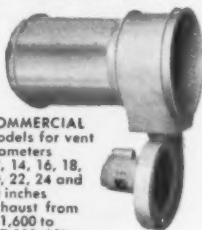
Greater capacities on
special order... send for
engineering data, today.

Quickdraft
COMPANY

Dueber-Hampden Building
P. O. Box 87-D • Canton 1, Ohio



STANDARD AND HEAVY DUTY
models for vent diameters 4, 6,
7, 8, 9 and 10-inches exhaust
from 8,460 to 60,000 CFH...
(with or without stacks).



COMMERCIAL
models for vent
diameters
12, 14, 16, 18,
20, 22, 24 and
30 inches
exhaust from
141,600 to
877,000 CFH
... (with
or without stacks).



TIME SAVING
E-Z-ON
DAMPER REGULATORS
PERMIT
INSTANT ASSEMBLY

(Shown— headpiece of #27 E-Z-ON)

It's the little things that
make the Big difference!

Advanced design of E-Z-ON damper regulators permits on-the-job
Assembly with only a hammer — no drilling — no rivets. This 16
gauge steel regulator is simply positioned on the damper by sliding
it over the scribed center line. The E-Z-ON accurately stays in posi-
tion until a hammer blow drives the sharp prongs through the
damper (E-Z-ON prongs will pierce 22 gauge metal.)

E-Z-ONS PROVED MORE PROFITABLE

Job Histories prove that your apprentice or journeyman can save
two-thirds of their damper makeup time with E-Z-ONS.

M. A. GERETT Corp.

724 W. Winnebago, Milwaukee, Wis.

Stocked in CANADA by
THERMIDAIRE CORP.
7-9 Cumberland Street, Toronto

STYLE & SIZE
Famous E-Z-ON standard
design No. 27
Solid end tail piece, threaded
head piece and wing nut —
3/8" bearing.

Superior E-Z-ON
"Snap-Tite" Design No. 29
Tail piece with retractable
snap end bearing, threaded
head piece and wing nut —
3/8" bearing.



**DO ALL These Jobs
with ONE TOOL**
SMITH'S
180° UNIVERSAL BRAKE

Smith's 180° Universal Brake is the answer to the need for
one low cost tool that can handle a wide variety of bending and
forming jobs with speed and accuracy. Designed to
permit selective bending of portions of a workpiece without
restriction, the Universal Brake's application and use is
literally unlimited. It will handle 18 gauge mild steel 26"
wide to 7 gauge 1 1/4" wide, at any angle, up to 180° in one
operation. It has adjustable angle stops and back gauges to
assure precise duplication of work pieces, making it a very
valuable production tool. Write for illustrated circular and
more details.

R. E. SMITH

1124 ELIZABETH AVENUE
WAUKEGAN, ILLINOIS



*I give my customers
the BEST!*

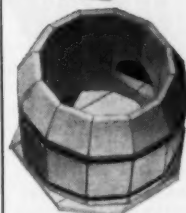
The Instant-Glo

CUSTOM-BUILT INSULATING BRICK

COMBUSTION CHAMBER



STANDARD ROUND TYPE
for Boilers
and Cast Iron Furnaces
Sizes up to 2.0 GPH



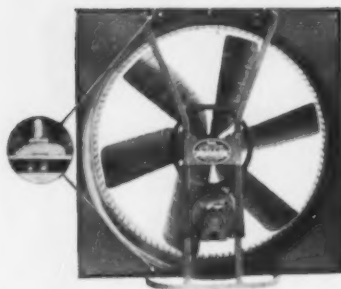
ROUND "A" TYPE
Specially Designed for
Steel Furnaces
(Can be used on any job where
round chamber is desirable.)
Sizes up to 1.75 GPH



"NARROWBOY"
for Narrow Boilers
and Furnaces
Sizes up to 5.0 GPH
Write for complete
specification sheet

BOSTON MACHINE WORKS COMPANY

Oil Heating Supplies Division, Manufacturers, Lynn, Mass.



- **Easier to Install**
- **New Quiet Operation**
- **Competitive Prices**

COOLAIR Ventilating Fans

For quiet, general purpose ventilation at lowest cost, you can't beat the Coolair type CQ shown here. It's ideal for schools, auditoriums, and stores... wherever a quiet fan is needed.

Exclusive rubber vibration insulators, as shown in the insert photo, are built into the fan frame. You can meet specifications for resilient-mounted, wall-type fans with far less installation trouble and cost. No bother with mounting fan on rubber or felt.

Proof that Coolair prices are competitive—Coolair fans were used on all four U. S. 3rd Army barracks rehabilitation projects started in the summer of 1955.

Write for Free Catalog Folder:



AMERICAN COOLAIR CORPORATION

3610 Mayflower Street
Jacksonville 3, Florida



YOU Need This Air Conditioning Catalog

Wholesale Only

It's FREE

*Illustrates,
Prices and
Describes*

OVER 10,000 ITEMS

AIR

**CONDITIONING
REFRIGERATION
ELECTRIC MOTORS
Parts and Supplies**

We sell you — NOT your customers. And we sell for less. Buy — by mail — with confidence from our **DEPENDABOOK** catalog. Prompt deliveries of fresh stock — for less!

Write for your copy today on your letterhead to

The HARRY ALTER CO., INC.

1717 S. Wabash Avenue, Dept. G, Chicago 16, Illinois

Branches in New York, Dallas, Atlanta

appointments . . .

► **R. H. JONES** as general manager of the Air Conditioning Div., General Electric Co. Mr. Jones, who joined the company in 1939, was general manager of the company's Low Voltage Switchgear Department in Philadelphia before his recent promotion.



R. H. Jones



Robert E. Drury

► **ROBERT E. DRURY** as vice president and assistant secretary of the Redmond Motor Co. Mr. Drury continues in his post of director of manufacturing.

► **HAL O. CHAMBERLAIN** as manager of zone control sales for Minneapolis-Honeywell Regulator Co., a newly created position. For the past year and a half Mr. Chamberlain has been assistant sales manager of the company's home products division.

► **W. A. BURBINE** as director of heating sales for Crane Co. Mr. Burbine, formerly midwest district manager, has been with the company since 1930.

► **GORDON N. GRAY** as manager of manufacturing for all of the plants of the Bryant Div., Carrier Corp. In his new position, Mr. Gray, formerly plant manager of the division's headquarters plant at Indianapolis, will supervise manufacturing of residential furnaces at Indianapolis; air conditioning equipment, water heaters and unit heaters at Tyler, Texas; and specialized controls for the heating industry at New Lexington, Ohio. Bob McElwain has been appointed southeast regional sales manager for the division. He will have headquarters in Atlanta. Robert R. Good has been named regional representative in the southwest territory, with headquarters in Dallas.

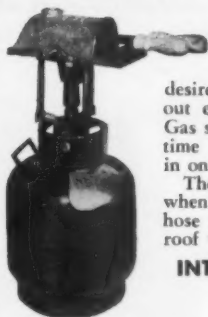
► **BERNARD M. FRAWLEY** as general sales manager for Vornado Distributing Co., Inc. in Baltimore. Mr. Frawley was formerly connected with Bendix Home Appliance Div., Avco Mfg. Corp. as regional sales manager for the midwestern division and district sales manager for the eastern division.

► **ROBERT J. PIERSON, JR.** as national advertising and sales promotion manager of the Plumbing and Heating Div., Rheem Mfg. Co. He replaces B. Edward Soby, who has resigned to start his own business in

**INSTANT
LIGHTING**

Insto-Gas
T. M. REG. U. S. PAT. OFF.

SOLDERING IRON HEATER



Sheet metal contractors can now have hot soldering irons in 2 minutes and with Insto-Gas they can be kept at the desired temperature all day long without even looking at the heater. Insto-Gas saves 40% on fuel cost and enough time to pay for the entire equipment in one week's operation.

The Insto-Gas soldering iron heater when attached to the cylinder by 50-ft hose can be operated on a scaffold or roof without moving the cylinder.

INTERNALLY FIRED SOLDERING IRONS

These Insto-Gas soldering irons are designed for continuous operation with no stopping to change irons. Made in three sizes; the No. 1-S (2) for fine work; the No. 2-S (5) and the No. 2-S (8) for heavy soldering.

Listed by Underwriters Laboratories and Factory Mutual Laboratories

Write For Free Folder

INSTO-GAS CORPORATION
DETROIT 7, MICHIGAN

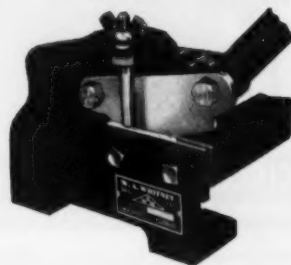
ASK FOR NEW FOLDER ON INSTO-HOT SALAMANDERS



YOUR BEST INVESTMENT . . . WHITNEY LEVER PUNCHES

**PORTABLE
HAND
OPERATED
PUNCHES AND
SHEARS.
A TOOL FOR
EVERY
PURPOSE.
LEADERS
SINCE 1907**

**CHICAGO STEEL
SLITTING SHEAR**



Please Write
Today for
Literature

For cutting 3/16" x 2" bars — 10 gauge sheets or by cutting each leg of 1/8" angle iron and breaking the corner, angle iron may be cut with very little distortion.

See Your Jobber



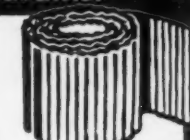
WHITNEY MFG. CO.
636 RACE ST. ROCKFORD, ILL.

NEW!

**Concealed thru-wall flashing
"When it rains.....it drains!"**

FOR USE AT:

- Spandrels • Sills
- Window Heads



is cross-corrugated for rigidity and quick drainage. It can be hand-formed to shape right on the job . . . eliminating all shop labor. Makes rigid bends that stay in position . . . an important feature when turned up on inside on walls to keep moisture from getting into the building.

In 100-ft. rolls to eliminate end laps.

Made of Cheney CHINC*

- Light in Weight
- Will not corrode in mortar
- Defies damp rot — contains no paper, felt, asphalt or organic fibers.

Inquire About
Cheney 3-Way
Flashing

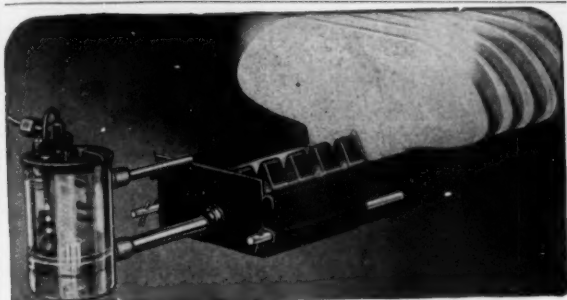
Cut Flashing Costs with CHINC Sheets

*CHINC meets U. S. Govt. specifications calling for zinc alloy metal in lieu of copper.



CHENEY

Write for NEW CATALOG . . . CHENEY FLASHING CO.
Dept. AA7, Trenton, New Jersey



There's a PROPER SIZE Monmouth for every Heating Unit

Monmouth does not offer just one size Humidifier for all heating units. It provides a complete range of sizes and capacities to do the job properly — for the correct size pan and correct number of plates are essential to efficient operation. This is especially vital with modern automatic forced air heat, with relatively low bonnet temperature, where sufficient diffusion to convey moisture to the volume of air handled is absolutely necessary. When you install the proper size Monmouth, your job is not half done, but ALL done. The complete line includes various Flotrol Models — the No. 310 for your smaller jobs and the Monmouth gas-fired Humidity Conditioner for all radiator systems. Write for descriptive Bulletins.

THE CLEVELAND HUMIDIFIER CO.

7802 Wade Park Avenue

Cleveland 3, Ohio

**MONMOUTH
HUMIDIFIERS**

Convert Gravity Furnaces With A **CIRCULATAIRE** Bonnet Blower



CIRCULATAIRE ELIMINATES COLD ROOMS,
BALANCES HEAT DISTRIBUTION, SAVES FUEL

CIRCULATAIRE solves the problem of "hard to heat" rooms, boosts warm air quickly through all the heating pipes. CIRCULATAIRE is easily and quickly installed without removing the bonnet. Packaged unit includes motor and fan control. No new sheet metal work required, no changing of cold or warm air pipes, no baffles to be built. The CIRCULATAIRE is rigid, quiet and efficient in operation.

NOW READY—New CIRCULATAIRE Sales Aids add effectiveness to selling interview, conserves valuable selling time and increases sales.

A COMPLETELY PACKAGED UNIT
Nothing for the dealer to furnish except limited amount of labor.



GET THE FACTS TODAY! WRITE...

CIRCULATAIRE DIVISION OF CORLETT-TURNER CO.
1007 S. KOSTNER AVE., CHICAGO 24.

Combustioneer



the quality line of
heating equipment
engineered with
exclusive features for
FAST SALES...
BRILLIANT PERFORMANCE!

Competition can't match the high quality
of these Combustioneer products:

- Low pressure conversion oil burner
- Gas conversion burner
- High pressure conversion oil burner
- Oil, gas and coal furnaces from 80,000 to 250,000 BTU output

For details and prices, write:



Combustioneer

The Steel Products Engineering Division

THE KELSEY-HAYES WHEEL COMPANY, SPRINGFIELD, OHIO



appointments

(Continued)

the San Francisco area. Mr. Pierson was previously national product manager, water heaters, in which capacity he is being succeeded by D. W. Proulx. Prior to his recent promotion, Mr. Proulx was assistant sales manager for plumbing and heating of the Chicago region.



Paul S. Nix



Cecil W. Roberts

► **PAUL S. NIX**, 646 Riviera Dr., Tampa, Fla. as direct factory representative in the state of Florida for Boston Machine Works Co. Cecil W. Roberts, L-6 Beverly Apts., Asheville, N. C. has been named direct factory representative for the states of Georgia and Tennessee. Both men will handle "BosMaco" oil heating supplies and will work with wholesale heating concerns in their respective territories.



Charles A. Gomer



Richard E. Whitney

► **CHARLES A. GOMER** as district sales manager for the Baltimore sales district of Inland Steel Products Co. During the past 10 years he has served as dealer salesman, assistant metal lath supervisor and sales engineer in the Baltimore branch area. Richard E. Whitney has been appointed sales engineer in the Detroit branch.

► **JOHN B. HEIL**, application engineer of Century Electric Co.'s Atlanta office, as acting district manager at Birmingham.

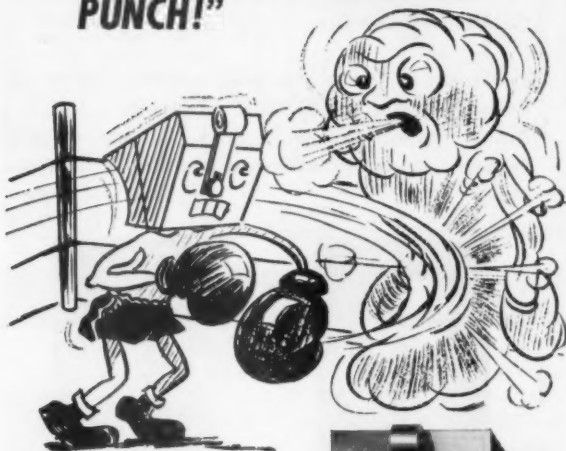
► **ANTHONY N. PELLEGRINI** as head of the newly opened Detroit office of Lima Electric Motor Co. The new office is located at 6432 Cass Ave.

► **WILLIAM P. O'CONNOR** and **George J. Salmon** as sales engineers for the Powers Regulator Co. Mr. O'Connor has been assigned to the New York office and

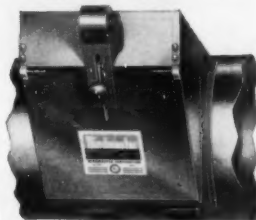
Windmaster The Modern Draft Control
that's "QUICKER ON THE DRAW"

and

"PACKS a STRONGER
PUNCH!"

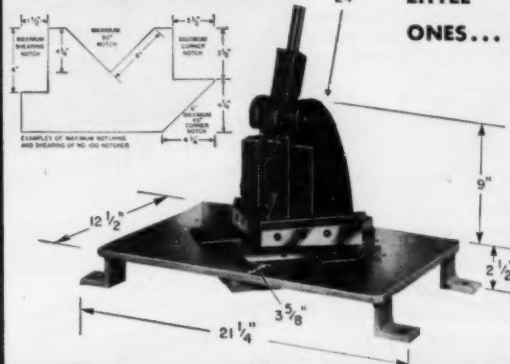


Windmaster
Draft Controls
43 Vine St.
Columbus 15, Ohio



MAKES **BIG
NOTCHES**

OR
LITTLE
ONES...



WHITNEY-JENSEN No. 100
HAND METAL NOTCHER

Capacity, 90° notch 4 1/4" deep in 16-ga. mild steel. V-ram with adjustable gibs assures positive blade and die alignment. Aviation type bearings for smooth and easy operation. A useful, versatile tool for any metal shop.

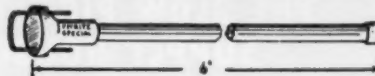
WHITNEY METAL TOOL COMPANY
702 Forbes St., Rockford, Ill. Since 1910

More
Profit
Comes from
Installations
using
Standardized
HANDY
PIPE

F Meyer & Bro. Co.
Peoria, Illinois

GOOD JOBS NEED GOOD TOOLS

For Longer-Lasting, Cooler-Handling use the
"FITRITE" SPECIAL ALUMINUM MOP HANDLE.

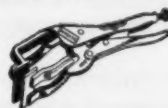


Light weight, unbreakable, economical. Will not burn. It's job-tested, engineer approved, and offers many exclusive features that make it the most popular Roofers' Mop Handle made. Offered in 6', 7', and 8' lengths.

A MECHANIC'S THIRD HAND

"FITRITE"
3-WAY
CLAMP

Throat 3 5/8" deep
Jaws 3 1/2" x 3/4"



A necessary tool for every sheet metal man. Use it for on-the-job bending, forming, seaming, straightening.
Price \$3.55

"FITRITE" SAFETY HOISTING HOOK

The Sliding Sleeve is gravity operated and drops into position automatically keeping any item safely locked in while hoisting.

For 1" rope or cable.



A new hoisting hook for safely hoisting buckets and other materials.

Price \$2.50

To protect the trade, please use your printed stationery

DAVID LEVOW 308 West 20 St.
NEW YORK, N.Y.
Telephone: TRIN 2-1400 (2400)

QUIET AUTOMATIC
OIL FIRED WATER HEATER

CONVERSION & FLANGED BURNERS for Any Make of Boiler or Furnace

NOT THE CHEAPEST but the B-E-S-T
OIL FIRED DOMESTIC HOT WATER HEATERS
Uses \approx 2 oil and connects to your regular fuel oil tank

GUN TYPE HOT WATER HEATERS

- GLASS LINED**
#30 G—118 Gals. Per Hour Recovery
- COPPER LINED**
#30 T—118 Gals. Per Hour Recovery
#45 T—200 Gals. Per Hour Recovery
- 10-YEAR WARRANTY**
- GALVANIZED**
#90 WH—10 Ga.
#200 WH—with Anode Rods

GUN TYPE Floor Furnace
#2 Oil

WINTER AIR CONDITIONING FURNACE for Any Home
Suspended or Laydown

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THE KIRK & BLUM MFG. CO.
3180 Forrer St., Cincinnati 9, O.

appointments

(Continued)

Mr. Salmon will work out of the Washington office. Other new sales engineers are Leo P. Christiansen and Finn Litsheim, both of whom have been assigned to the Minneapolis office.

► **GEORGE C. ARNOLD** as field representative in the Boston area for the L. O. F Glass Fibers Co. Mr. Arnold replaces George R. Frick who was recently promoted to district sales manager in the Syracuse area.



George C. Arnold



Ola E. Williamson

► **OLA E. WILLIAMSON** as sales engineer for the Jani-trol Heating & Air Conditioning Div., Surface Combustion Corp. He will handle the sale of residential and commercial heating and cooling equipment in the states of Nebraska, Kansas and the Dakotas.

► **DAN PHILLIPS** as metropolitan Toronto salesman for Mueller Climatrol. Mr. Phillips will have headquarters in the Mueller Climatrol Division-Worthington Canada, Ltd. office at 322 Kipling Ave., S., Toronto. Edward Knott, 177 Ashland Ave., Fond du Lac has been named the company's representative in northern Wisconsin and the upper Michigan peninsula.

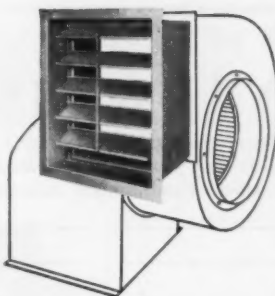
► **GEORGE F. HEATH CO., INC.** as representative in the St. Louis area for the Fan and Blower Div., Peerless Electric Co. Two new southern representatives for the division are George W. Hendrix, who will base his operations in Atlanta, and R. B. Hamilton, who will work out of Hickory, N. C.

► **ROBERT H. BUTT** as manager of the field engineering department for Huck Mfg. Co. Mr. Butt has been active for the past eight years in sales engineering work in the Detroit area. Daniel D. Hicks, for the past 10 years a sales engineer in the southeastern part of the country, has been appointed field engineer to cover the Florida area.

CORRECTION—It was erroneously noted in our March issue that W. F. Winter, Galesburg, Ill., had been appointed a manufacturer's representative by the Berger Furnace Corp.

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MANUFACTURERS OF FURNACE PIPE AND FITTINGS, Prefabricated Ducts,

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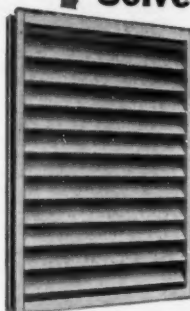
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situations open . . .

Our sales program calls for the opening, in the near future, of several new territories. If you are experienced in selling heating and air conditioning equipment to dealers, we may have a good opportunity for you. Send full information concerning your education, experience and income requirements to CONCO ENGINEERING WORKS, Heating and Air Conditioning Division, Mendota, Illinois.

Sheet metal men. First class all around mechanics. Must know layout, fabrication, 28 to 35 yrs. Only ambitious men need apply. Union shop. Write stating qualifications. AMERICAN SHEET METAL, 2709 Halladay St., Santa Ana, California.

Independent, established and reputable company in fast expanding community of 60,000 in central Ohio has opening for sales engineer for retail selling of heating and air conditioning equipment in residential and small commercial buildings. Position will pay between 7 to 10 thousand on commission and draw basis for first year; more to an alert, efficient and aggressive man. Address Key 1051, American Artisan, 6 N. Michigan Ave., Chicago 2, Illinois.

for sale . . .

1/4" Ribbed Wire Glass Stock Sheets. 30c sq. ft., cut sizes slightly extra, plus boxing. F.O.B. our warehouse. Atcheson Glass Co., 920 Main St., Buffalo, New York.

business opportunities . . .

Business for sale — Warm Air Heating and Air Conditioning business, including inventory, equipment, truck and a five room house and bath. This business is located in North Western Pennsylvania. Write Key 1050, American Artisan, 6 N. Michigan Ave., Chicago 2, Ill.

FOR SALE — Sheet Metal Business, continuous operation for over 30 years. Central Penna. Address Key 1052, American Artisan, 6 North Michigan Avenue, Chicago 2, Illinois.

Wanted: Buyer for going Sheet Metal Business. In the heart of Defense Construction Area. Well equipped and stocked shop. Two pick-up trucks. Office furnishings. Owner selling due to illness. Address Key 1053, American Artisan, 6 N. Michigan Ave., Chicago 2, Ill.

agents wanted . . .

Prominent midwestern heating and air conditioning manufacturer needs experienced salesman to develop new wholesaler distribution. Man chosen must be willing to travel extensively. Excellent financial possibilities. Write, giving full details of experience and earnings. Include photograph. If your qualifications fit our need, we'll arrange for an interview at our expense. Write Key 1049, American Artisan, 6 N. Michigan Ave., Chicago 2, Ill.

lines wanted . . .

Manufacturers Attention! Do you have a good sound product that needs high class representation in this midwest area? Our company is new, but is based on successful background in the Heating and Air Conditioning Fields. If your product is right we will guarantee the volume. For more information, write: Sales Research Co., Box 98, Sioux Falls, South Dakota.

miscellaneous . . .

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Manufacturers' Agents

Are you interested in securing additional lines?

We are occasionally asked by our manufacturer advertisers to suggest the names of manufacturers' agents in various sections of the country whom they can contact in regard to representation of their warm air heating, residential air conditioning and sheet metal products.

If you would like your name listed on our records for inquiries we may receive on your territory, we invite you to write us. There is no charge in connection with this service.

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Chicago 2, Ill.



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to their doctors
in time

Many thousands of Americans are being cured of cancer every year. More and more people are going to their doctors *in time*. That is encouraging!

But the tragic fact, our doctors tell us, is that every third cancer death is a needless death...*twice* as many could be saved.

To learn how to head off cancer, call the American Cancer Society office nearest you or simply write to "Cancer" in care of your local Post Office.

American Cancer Society



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Rates for display space in the Service Section are \$12.00 per inch per insertion. One-inch minimum space accepted. Closing date — twentieth of the month preceding issue.

This section represents an ideal opportunity for manufacturers to get their messages across to readers of a national publication in their field. Whatever you make or sell, you'll find a large, receptive audience, easily reached at a minimum outlay. Plan now to move your products quickly and economically with consistent advertisements in this section.

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To avoid missing any issue of *American Artisan* it is more important than ever to report both your new and old address to us and your post office. Deadline is the 18th of the preceding month for the next issue. Send changes — and new local postal delivery zone — to

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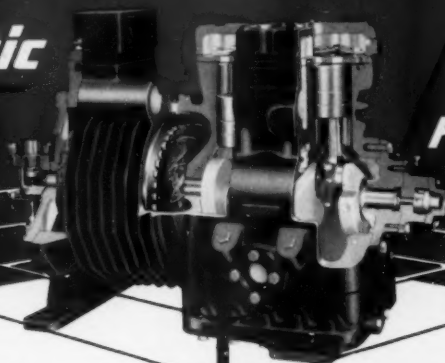
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***PACKS
SALES
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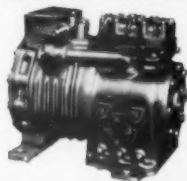
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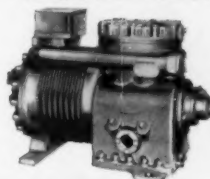
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2, 3, 5, 7½ H.P.
Model shown is
8R6-200, 2 H.P.



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3, 7½ and 10 H.P.
Model shown is
the new 9R8-1000,
10 H.P.

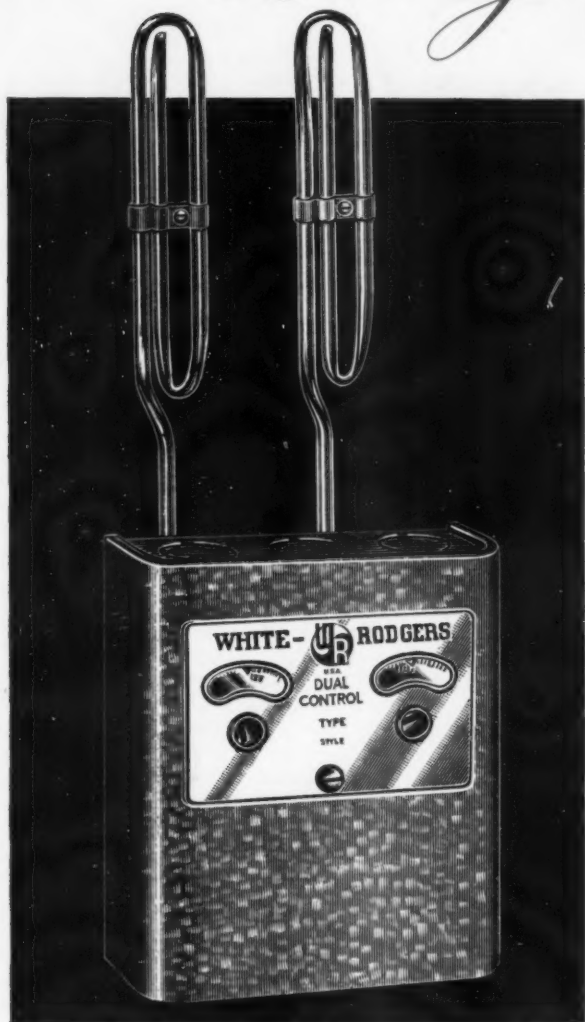
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REFRIGERATION CORPORATION, Sidney, Ohio

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Quality

**tells its story ...
in top performance**



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